Analyzing the Boltzmann's equation. Mathematical connections and applications of κ formula regarding the Zeros of Riemann Zeta Function, String Theory and Ramanujan Mathematics.

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Abstract

In this research thesis we analyze the Boltzmann's equation. We describe the possible mathematical connections and applications of κ formula regarding the Zeros of Riemann Zeta Function, the String Theory and the Ramanujan Mathematics.

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Ludwig Eduard Boltzmann (1844-1906)

Vesuvius landscape with gorse – Naples

https://www.pinterest.it/pin/95068242114589901/

We want to highlight that the development of the various equations was carried out according an our possible logical and original interpretation

From:

Complex Analysis in Number Theory – 22.11.1994 - *Anatoly A. Karatsuba*

We have that:

Dirichlet's series define the main generating functions of the multiplicative number theory.

Definition 1. A Dirichlet's series is an expression

$$f(s) = \sum_{n=1}^{\infty} \frac{a(n)}{n^s}, \tag{1.1}$$

where $a(n)$ are complex numbers (coefficients of the Dirichlet's series) $s = \sigma + it$, σ and t are real numbers, $i^2 = -1$.

Example 1. Riemann's zeta-function $\zeta(s)$. For $\operatorname{Re} s > 1$ the $\zeta(s)$ function is defined by a Dirichlet series of the form

$$\zeta(s) = \sum_{n=1}^{\infty} \frac{1}{n^s}. \tag{1.2}$$

Since for $\operatorname{Re} s \geq \sigma_0 > 1$ the series in (1.2) converges absolutely and uniformly, it follows, according to Weierstrass' theorem, that for $\operatorname{Re} s > 1$ the function $\zeta(s)$ is an analytic function. For $\operatorname{Re} s > 1$ Euler's identity (I.1) is valid for $\zeta(s)$.

Example 12. For $\operatorname{Re} s > 1$ the Davenport-Heilbronn function $f(s)$ (see [42, 209, 95]) is defined by the Dirichlet series

$$f(s) = \sum_{n=1}^{\infty} \frac{r(n)}{n^s},$$

where $r(1) = 1$, $r(2) = \varkappa$, $r(3) = -\varkappa$, $r(4) = -1$, $r(5) = 0$, $r(n+5) = r(n)$, $\varkappa = \frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}$.

Theorem. *Suppose that $G(s)$ is an entire function of finite order, $P(s)$ is a polynomial, $f(s) = G(s)P^{-1}(s)$, and the series $f(s) = \sum_{n=1}^{\infty} a(n)n^{-s}$ is absolutely convergent for* $\operatorname{Re} s > 1$. *Further suppose that*

$$\pi^{-s/2}\Gamma\left(\frac{s}{2}\right) f(s) = \pi^{-(1-s)/2}\Gamma\left(\frac{1-s}{2}\right) g(1-s), \tag{3}$$

where the series $g(1-s) = \sum_{n=1}^{\infty} b(n)n^{-1+s}$ is absolutely convergent for $\operatorname{Re} s < -\alpha < 0$. *Then*

$$f(s) = C\zeta(s),$$

where C is a constant.

Note that (3) is even weaker than (2). The question naturally arises: does a functional equation of the type (2) determine the location of the zeros of the corresponding function? It turns out that this is not the case. A simple counterexample is given by the following function $f(s)$, which was introduced by Davenport and Heilbronn [3] in 1936:

$$f(s) = \frac{1-i\kappa}{2} L(s, \chi_1) + \frac{1+i\kappa}{2} L(s, \overline{\chi}_1), \tag{4}$$

where $\kappa = (\sqrt{10-2\sqrt{5}}-2)/(\sqrt{5}-1)$ and $\chi_1 = \chi_1(n)$ is the Dirichlet character modulo 5 with

$$\chi_1(2) = i, \qquad i^2 = -1,\ L(s, \chi_1) = \sum_{n=1}^{\infty} \chi_1(n) n^{-s}, \qquad \operatorname{Re} s > 0.$$

For $\operatorname{Re} s > 0$ the function $f(s)$ has the following representation as a Dirichlet series:

$$f(s) = \sum_{n=1}^{\infty} r(n) n^{-s}, \tag{5}$$

where $r(n) = r(m)$ if $n \equiv m \pmod 5$, and $r(1) = 1$, $r(2) = \kappa$, $r(3) = -\kappa$, $r(4) = -1$, $r(5) = 0$. In addition, $f(s)$ satisfies the functional equation

$$g(s) = g(1-s), \qquad g(s) = \left(\frac{\pi}{5}\right)^{-s/2} \Gamma\left(\frac{s+1}{2}\right) f(s). \tag{6}$$

(4) $$f(s) = \frac{1 - i\kappa}{2} L(s, \chi_1) + \frac{1 + i\kappa}{2} L(s, \overline{\chi}_1),$$

where $\kappa = (\sqrt{10 - 2\sqrt{5}} - 2)/(\sqrt{5} - 1)$ and $\chi_1 = \chi_1(n)$ is the Dirichlet character modulo 5 with

$$\chi_1(2) = i, \qquad i^2 = -1, \; L(s, \chi_1) = \sum_{n=1}^{\infty} \chi_1(n) n^{-s}, \qquad \mathrm{Re}\, s > 0.$$

From:

On the Zeros of the Davenport Heilbronn Function
S. A. Gritsenko - Received May 15, 2016 - ISSN 0081-5438, Proceedings of the Steklov Institute of Mathematics, 2017, Vol. 296, pp. 65–87.

We have:

Let

$$\varkappa = \frac{\sqrt{10 - 2\sqrt{5}} - 2}{\sqrt{5} - 1}$$

and χ_1 be a character modulo 5 such that $\chi_1(2) = i$.

The Davenport–Heilbronn function $f(s)$ is defined by the equality

$$f(s) = \frac{1 - i\varkappa}{2} L(s, \chi_1) + \frac{1 + i\varkappa}{2} L(s, \overline{\chi}_1), \qquad \text{where} \quad L(s, \chi) = \sum_{n=1}^{\infty} \frac{\chi(n)}{n^s}.$$

The function $f(s)$ satisfies the Riemann-type functional equation

$$g(s) = g(1 - s), \qquad \text{where} \quad g(s) = \left(\frac{\pi}{5}\right)^{-s/2} \Gamma\left(\frac{s+1}{2}\right) f(s),$$

but there is no Euler product for it.

$$(\sqrt{10 - 2\sqrt{5}} - 2)/(\sqrt{5} - 1) = \kappa$$

Input:

$$\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}$$

Decimal approximation:

0.2840790438404122960282918323931261690910880884457375827591626661...

0.28407904384…. = κ

Alternate forms:

$$\frac{1}{4}\left(\sqrt{10-2\sqrt{5}}-2\sqrt{5}+\sqrt{5\left(10-2\sqrt{5}\right)}-2\right)$$

$$\frac{1}{4}\left(1+\sqrt{5}\right)\left(\sqrt{10-2\sqrt{5}}-2\right)$$

$$\frac{1}{2}\left(-1-\sqrt{5}+\sqrt{2\left(5+\sqrt{5}\right)}\right)$$

Minimal polynomial:

$$x^4+2x^3-6x^2-2x+1$$

Expanded forms:

$$\frac{\sqrt{10-2\sqrt{5}}}{\sqrt{5}-1}-\frac{2}{\sqrt{5}-1}$$

$$\frac{1}{4}\sqrt{10-2\sqrt{5}}+\frac{1}{4}\sqrt{5\left(10-2\sqrt{5}\right)}+\frac{1}{2}\left(-1-\sqrt{5}\right)$$

For (((($\sqrt{}$(10-2$\sqrt{}$5) -2))/(($\sqrt{}$5-1)))) = 8πG; G = 0.011303146014

Indeed:

(((($\sqrt{}$(10-2$\sqrt{}$5) -2))/(($\sqrt{}$5-1))))/(8π)

Input:

$$\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{8\pi}$$

Result:

$$\frac{\sqrt{10-2\sqrt{5}}-2}{8\left(\sqrt{5}-1\right)\pi}$$

Decimal approximation:

0.0113031460140052147973750129442035744685760313920017808594909667
...

0.01130314…. = g (gravitational coupling constant)

Property:

$$\frac{-2+\sqrt{10-2\sqrt{5}}}{8\left(-1+\sqrt{5}\right)\pi}$$ is a transcendental number

Alternate forms:

$$\frac{\sqrt{10-2\sqrt{5}}-2\sqrt{5}+\sqrt{5\left(10-2\sqrt{5}\right)}-2}{32\pi}$$

$$-\frac{1+\sqrt{5}-\sqrt{2\left(5+\sqrt{5}\right)}}{16\pi}$$

$$\frac{-1-\sqrt{5}+\sqrt{2\left(5+\sqrt{5}\right)}}{16\pi}$$

Expanded forms:

$$-\frac{1}{16\pi}-\frac{\sqrt{5}}{16\pi}+\frac{\sqrt{10-2\sqrt{5}}}{32\pi}+\frac{\sqrt{5\left(10-2\sqrt{5}\right)}}{32\pi}$$

$$\frac{\sqrt{10-2\sqrt{5}}}{8\left(\sqrt{5}-1\right)\pi}-\frac{1}{4\left(\sqrt{5}-1\right)\pi}$$

Series representations:

$$\frac{\sqrt{10-2\sqrt{5}}-2}{(8\pi)\left(\sqrt{5}-1\right)}=\frac{-2+\sqrt{9-2\sqrt{5}}\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(9-2\sqrt{5}\right)^{-k}}{8\pi\left(-1+\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)}$$

$$\frac{\sqrt{10-2\sqrt{5}}-2}{(8\pi)(\sqrt{5}-1)} = \frac{-2+\sqrt{9-2\sqrt{5}}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(9-2\sqrt{5})^{-k}}{k!}}{8\pi\left(-1+\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}$$

$$\frac{\sqrt{10-2\sqrt{5}}-2}{(8\pi)(\sqrt{5}-1)} = \frac{-2+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(10-2\sqrt{5}-z_0)^k z_0^{-k}}{k!}}{8\pi\left(-1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)}$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

We note that:

(((√(10-2√5) -2))/((√5-1)))*((2 i (sqrt(5) - 1) t + sqrt(5) - 1)/(2 (sqrt(2 (5 - sqrt(5))) - 2)))

Input:

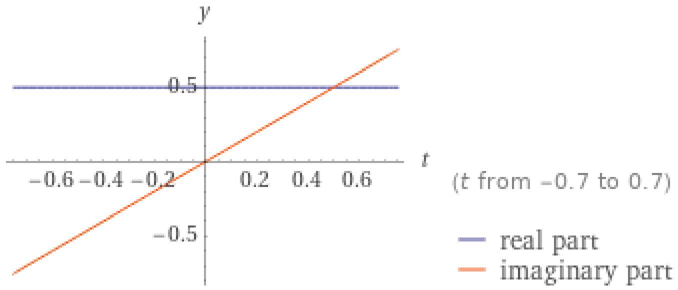
$$\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1} \times \frac{2i(\sqrt{5}-1)t+\sqrt{5}-1}{2\left(\sqrt{2(5-\sqrt{5})}-2\right)}$$

i is the imaginary unit

Exact result:

$$\frac{\left(\sqrt{10-2\sqrt{5}}-2\right)\left(2i(\sqrt{5}-1)t+\sqrt{5}-1\right)}{2(\sqrt{5}-1)\left(\sqrt{2(5-\sqrt{5})}-2\right)}$$

Plot:



Alternate form assuming t>0:

$$\frac{i\sqrt{10-2\sqrt{5}}\,t}{\sqrt{2(5-\sqrt{5})}-2}-\frac{2\,i\,t}{\sqrt{2(5-\sqrt{5})}-2}+\frac{\sqrt{5(10-2\sqrt{5})}}{2(\sqrt{5}-1)\left(\sqrt{2(5-\sqrt{5})}-2\right)}-\frac{\sqrt{10-2\sqrt{5}}}{2(\sqrt{5}-1)\left(\sqrt{2(5-\sqrt{5})}-2\right)}-\frac{\sqrt{5}}{(\sqrt{5}-1)\left(\sqrt{2(5-\sqrt{5})}-2\right)}+\frac{1}{(\sqrt{5}-1)\left(\sqrt{2(5-\sqrt{5})}-2\right)}$$

Alternate forms:

$$\frac{1}{8}(1+\sqrt{5})\left(2\,i\sqrt{2(3-\sqrt{5})}\,t+\sqrt{5}-1\right)$$

$$\frac{1}{2}(1+2\,i\,t)$$

$$\frac{1}{2} + i\,t$$

1/2+it = real part of every nontrivial zero of the Riemann zeta function

Derivative:

$$\frac{d}{dt}\left(\frac{\left(\sqrt{10-2\sqrt{5}}-2\right)\left(2\,i\left(\sqrt{5}-1\right)t+\sqrt{5}-1\right)}{\left(\sqrt{5}-1\right)\left(2\left(\sqrt{2\left(5-\sqrt{5}\right)}-2\right)\right)}\right) = i$$

Indefinite integral:

$$\int \frac{\left(\sqrt{10-2\sqrt{5}}-2\right)\left(2\,i\left(\sqrt{5}-1\right)t+\sqrt{5}-1\right)}{\left(\sqrt{5}-1\right)\left(2\left(\sqrt{2\left(5-\sqrt{5}\right)}-2\right)\right)}\,dt = \frac{t}{2} + \frac{i\,t^2}{2} + \text{constant}$$

And again:

(((√(10-2√5) -2))/((2x)))*((2 i (sqrt(5) - 1) t + sqrt(5) - 1)/(2 (sqrt(2 (5 - sqrt(5))) - 2))) = (1/2+it)

Input:

$$\frac{\sqrt{10-2\sqrt{5}}-2}{2\,x} \times \frac{2\,i\left(\sqrt{5}-1\right)t+\sqrt{5}-1}{2\left(\sqrt{2\left(5-\sqrt{5}\right)}-2\right)} = \frac{1}{2} + i\,t$$

i is the imaginary unit

Exact result:

$$\frac{\left(\sqrt{10-2\sqrt{5}}-2\right)\left(2\,i\left(\sqrt{5}-1\right)t+\sqrt{5}-1\right)}{4\left(\sqrt{2\left(5-\sqrt{5}\right)}-2\right)x}=\frac{1}{2}+i\,t$$

Alternate form assuming t and x are real:

$$\frac{\sqrt{5}-1}{x}=2$$

Alternate form:

$$\frac{\left(\sqrt{5}-1\right)(1+2\,i\,t)}{4\,x}=\frac{1}{2}+i\,t$$

Alternate form assuming t and x are positive:
$2\,x+1=\sqrt{5}$

Expanded forms:

$$\frac{i\sqrt{5\left(10-2\sqrt{5}\right)}\;t}{2\left(\sqrt{2\left(5-\sqrt{5}\right)}-2\right)x}-\frac{i\sqrt{10-2\sqrt{5}}\;t}{2\left(\sqrt{2\left(5-\sqrt{5}\right)}-2\right)x}-\frac{i\sqrt{5}\;t}{\left(\sqrt{2\left(5-\sqrt{5}\right)}-2\right)x}+\frac{i\,t}{\left(\sqrt{2\left(5-\sqrt{5}\right)}-2\right)x}+\frac{\sqrt{5\left(10-2\sqrt{5}\right)}}{4\left(\sqrt{2\left(5-\sqrt{5}\right)}-2\right)x}-\frac{\sqrt{10-2\sqrt{5}}}{4\left(\sqrt{2\left(5-\sqrt{5}\right)}-2\right)x}-\frac{\sqrt{5}}{2\left(\sqrt{2\left(5-\sqrt{5}\right)}-2\right)x}+\frac{1}{2\left(\sqrt{2\left(5-\sqrt{5}\right)}-2\right)x}=\frac{1}{2}+i\,t$$

$$\frac{i\sqrt{5}\,t}{2x} - \frac{i\,t}{2x} + \frac{\sqrt{5}}{4x} - \frac{1}{4x} = \frac{1}{2} + i\,t$$

Solutions:

$$t = \frac{i}{2}, \quad x \neq 0$$

$$x = \frac{\sqrt{5}}{2} - \frac{1}{2}$$

Input:

$$\frac{\sqrt{5}}{2} - \frac{1}{2}$$

Decimal approximation:

0.6180339887498948482045868343656381177203091798057628621354486227

…

0.6180339887…. $= \frac{1}{\phi}$

Solution for the variable x:

$$x = \frac{-2\,i\sqrt{5}\,t + 2\,i\,t - \sqrt{5} + 1}{-2 - 4\,i\,t}$$

Implicit derivatives:

$$\frac{\partial x(t)}{\partial t} = \frac{2\left(-1 + \sqrt{5} - 2x\right)x}{\left(-1 + \sqrt{5}\right)(-i + 2t)}$$

$$\frac{\partial t(x)}{\partial x} = \frac{\left(-1+\sqrt{5}\right)(-i+2t)}{2\left(-1+\sqrt{5}-2x\right)x}$$

From Wikipedia:

In statistical mechanics, **Boltzmann's equation** (also known as **Boltzmann–Planck equation**) is a probability equation relating the entropy S, also written as S_B, of an ideal gas to the quantity W, the number of real microstates corresponding to the gas's macrostate:

$$S = k_B \ln W$$

where k_B is the Boltzmann constant (also written as simply k) and equal to 1.38065×10^{-23} J/K.

We consider W equal to the some values of partition numbers

p(8192) =
1181439874128599109971249397860343958559859263335823651875555915473905892636341722762111648746675

p(8192) = W

from:

$S = k_B \ln W$

1.38e-23
ln(1181439874128599109971249397860343958559859263335823651875555915473905892636341722762111648746675)

Input interpretation:

$1.38 \times 10^{-23} \log($
1 181 439 874 128 599 109 971 249 397 860 343 958 559 859 263 335 823 651 875 555 915 473 905 892 636 341 722 762 111 648 746 675)

log(x) is the natural logarithm

Result:

$3.05277\ldots \times 10^{-21}$

$3.05277\ldots*10^{-21}$

Or also:

1.38e-23 ln(1.1814398741285991 × 10^96)

Input interpretation:

$1.38 \times 10^{-23} \log(1.1814398741285991 \times 10^{96})$

$\log(x)$ is the natural logarithm

Result:

$3.05277\ldots \times 10^{-21}$

$3.05277\ldots*10^{-21}$

From the Hawking radiation calculator, inserting this entropy value, we obtain the mass, the radius and the temperature:

M = 3.39232E-19

R = 5.03816E-46

T = 3.61686E41

E = 3.05277E-21

From the Ramanujan-Nardelli mock modular formula, we obtain:

sqrt(((1/((((4*1.962364415e+19)/(5*0.0864055^2)))*1/(3.39232e-19)* sqrt((-((((3.61686e+41 * 4*Pi*(5.038116e-46)^3-(5.038116e-46)^2))))) / ((6.67*10^-11)))))))

Input interpretation:

$$\sqrt{\left(1 \Big/ \left(\frac{4 \times 1.962364415 \times 10^{19}}{5 \times 0.0864055^2} \times \frac{1}{3.39232 \times 10^{-19}} \sqrt{-\frac{3.61686 \times 10^{41} \times 4\pi \left(5.038116 \times 10^{-46}\right)^3 - \left(5.038116 \times 10^{-46}\right)^2}{6.67 \times 10^{-11}}}\right)\right)}$$

Result:

1.618084701212420730971290068100347794094641082116507331153747485 3...

1.6180847…. result that is a very good approximation to the value of the golden ratio 1.618033988749...

p(4096) = 6927233917602120527467409170319882882996950147283323368445315320451

6.92723391760212 × 10^66

1.38e-23 ln(6.92723391760212 × 10^66)

Input interpretation:

$1.38 \times 10^{-23} \log\left(6.92723391760212 \times 10^{66}\right)$

$\log(x)$ is the natural logarithm

Result:

$2.12390\ldots \times 10^{-21}$

$2.12390\ldots{*}10^{-21}$

From the entropy value, we have that:

M = 2.82955E-19

R = 4.20235E-46

T = 4.33622E41

E = 2.12390E-21

and, as above:

sqrt(((1/((((4*1.962364415e+19)/(5*0.0864055^2)))*1/(2.82955e-19)* sqrt((-((((4.33622e+41 * 4*Pi*(4.20235e-46)^3-(4.20235e-46)^2))))) / ((6.67*10^-11)))))))

Input interpretation:

$$\sqrt{\left(1 \Big/ \left(\frac{4 \times 1.962364415 \times 10^{19}}{5 \times 0.0864055^2} \times \frac{1}{2.82955 \times 10^{-19}} \sqrt{-\frac{4.33622 \times 10^{41} \times 4\,\pi\,(4.20235 \times 10^{-46})^3 - (4.20235 \times 10^{-46})^2}{6.67 \times 10^{-11}}}\right)\right)}$$

Result:

1.6180781925207858848250587104900130629681494731626244730560357603
...

1.61807819252…. result that is a very good approximation to the value of the golden ratio 1.618033988749...

p(1024) = 61847822068260244309086870983975 = 6.184782206826024 × 10^31

1.38e-23 ln(6.184782206826024 × 10^31)

Input interpretation:

$1.38\times10^{-23}\log(6.184782206826024\times10^{31})$

log(x) is the natural logarithm

Result:

$1.01019\ldots\times10^{-21}$

$1.01019\ldots*10^{-21}$

We have that:

M = 1.95143E-19

R = 2.89819E-46

T = 6.28749E41

E = 1.01019E-21

and:

sqrt(((1/((((4*1.962364415e+19)/(5*0.0864055^2)))*1/(1.95143e-19)* sqrt((-((((6.28749e+41 * 4*Pi*(2.89819e-46)^3-(2.89819e-46)^2))))) / ((6.67*10^-11)))))))

Input interpretation:

$$\sqrt{\left(1 \middle/ \left(\frac{4 \times 1.962364415 \times 10^{19}}{5 \times 0.0864055^2} \times \frac{1}{1.95143 \times 10^{-19}} \sqrt{-\frac{6.28749 \times 10^{41} \times 4\,\pi\,(2.89819 \times 10^{-46})^3 - (2.89819 \times 10^{-46})^2}{6.67 \times 10^{-11}}}\right)\right)}$$

Result:

1.618080003821675999720663455809235680705648851474867065875182329 7

…

1.618080003821…. result that is a very good approximation to the value of the golden ratio 1.618033988749...

Now, we consider all the previous results and other partition numbers. We perform the following calculations:

p(12)

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(77))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38 \times 10^{-23}\log(77)}\right)$$

log(x) is the natural logarithm

Result:

49.910120…

49.910120…

p(24)

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1575))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log(1575)}\right)$$

log(x) is the natural logarithm

Result:

49.382538…

49.382538…

p(48)

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(147273))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log(147\,273)}\right)$$

log(x) is the natural logarithm

Result:

48.902329…

48.902329….

p(96)

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(118114304))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log(118\,114\,304)}\right)$$

log(x) is the natural logarithm

Result:

48.456400…

48.456400…

Mean:

(49.910120+49.382538+48.902329+48.456400) = **196.651387**

1/4(49.910120+49.382538+48.902329+48.456400)

Input interpretation:

$$\frac{1}{4}(49.910120 + 49.382538 + 48.902329 + 48.456400)$$

Result:

49.16284675

49.16284675

Furthermore, we have:

p(8)

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(22))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log(22)}\right)$$

$\log(x)$ is the natural logarithm

Result:

50.250362…

50.250362…

p(64)

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1741630)))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log(1\,741\,630)}\right)$$

log(x) is the natural logarithm

Result:

48.713705…

48.713705…

80 1/ Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1741630)))))]

Input interpretation:

$$80\times\frac{1}{\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log(1\,741\,630)}\right)}$$

log(x) is the natural logarithm

Result:

1.6422483132872894499242047788043166997451339868448208416769058787…

$1.64224831\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

p(1024)

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(6.184782206826024 × 10^31)))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log(6.184782206826024\times 10^{31})}\right)$$

$\log(x)$ is the natural logarithm

Result:

47.085645…

47.085645…

76 1/ (((Ln[((((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(6.184782206826024 × 10^31))))])))

Input interpretation:

$$76\times\frac{1}{\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log(6.184782206826024\times 10^{31})}\right)}$$

$\log(x)$ is the natural logarithm

Result:

1.6140800448879718407611806465561952242718063594687461036069354352…

1.614080044…. result that is a very good approximation to the value of the golden ratio 1.618033988749...

p(4096)

Ln[((((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(6.92723391760212 × 10^66))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log(6.92723391760212\times 10^{66})}\right)$$

$\log(x)$ is the natural logarithm

Result:

46.342528…

46.342528…

75 1/ Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(6.92723391760212 × 10^66))))]

Input interpretation:

$$75\times\frac{1}{\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times10^{-23}\log(6.92723391760212\times10^{66})}\right)}$$

log(x) is the natural logarithm

Result:

1.6183839…

1.6183839… result that is a very good approximation to the value of the golden ratio 1.618033988749...

p(8192)

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1.1814398741285991 × 10^96))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times10^{-23}\log(1.1814398741285991\times10^{96})}\right)$$

log(x) is the natural logarithm

Result:

45.979736…

45.979736…

76 1/ Ln[((((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1.1814398741285991 × 10^96))))]

Input interpretation:

$$76\times\frac{1}{\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times10^{-23}\log(1.1814398741285991\times10^{96})}\right)}$$

$\log(x)$ is the natural logarithm

Result:

1.6529020…

1.6529020… result that is quite near to the 14th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164.2696$ i.e. 1.65578...

Indeed, from:

$$G_{505} = P^{-1/4}Q^{1/6} = (\sqrt{5}+2)^{1/2}\left(\frac{\sqrt{5}+1}{2}\right)^{1/4}(\sqrt{101}+10)^{1/4}$$

$$\times\left((130\sqrt{5}+29\sqrt{101})+\sqrt{169440+7540\sqrt{505}}\right)^{1/6}.$$

Thus, it remains to show that

$$(130\sqrt{5}+29\sqrt{101})+\sqrt{169440+7540\sqrt{505}}=\left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3,$$

which is straightforward. □

$$\sqrt[14]{\left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3} = 1,65578\ldots$$

p(16384)

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(3.4400033735581529*10^137))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log(3.4400033735581529\times 10^{137})}\right)$$

log(x) is the natural logarithm

Result:

45.620949…

45.620949…

75 1/Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(3.4400033735581529*10^137))))]

Input interpretation:

$$75\times\frac{1}{\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log(3.4400033735581529\times 10^{137})}\right)}$$

log(x) is the natural logarithm

Result:

1.6439816…

1.6439816…≈ $\zeta(2) = \frac{\pi^2}{6}$ = 1.644934 ...

p(32768)

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1.9951134337408105736642454 27*10^196))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log(1.995113433740810573664245427\times 10^{196})}\right)$$

log(x) is the natural logarithm

Result:

45.265195…

45.265195…

73* 1/Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1.995113433740810573664245427*10^196))))]

Input interpretation:

$$73\times\frac{1}{\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log(1.995113433740810573664245427\times 10^{196})}\right)}$$

log(x) is the natural logarithm

Result:

1.6127181337225981392843101684648417983312098903836399583991569302…

1.6127181337…. result that is a very good approximation to the value of the golden ratio 1.618033988749...

Mean:

(50.250362 + 48.713705 + 47.085645 + 46.342528 + 45.979736 + 45.620949 + 45.265195) = 329.25812

1/7(50.250362 + 48.713705 + 47.085645 + 46.342528 + 45.979736 + 45.620949 + 45.265195)

Input interpretation:

$$\frac{1}{7}(50.250362 + 48.713705 + 47.085645 + 46.342528 + 45.979736 + 45.620949 + 45.265195)$$

Result:

47.036874285714285714285714285714285714285714285714285714285...

Repeating decimal:

$47.03687\overline{428571}$ (period 6)

47.03687428571

General mean of the two sequences:

1/2((1/7(50.250362 + 48.713705 + 47.085645 + 46.342528 + 45.979736 + 45.620949 + 45.265195)+1/4(49.910120 + 49.382538 + 48.902329 + 48.456400)))

Input interpretation:

$$\frac{1}{2}\left(\frac{1}{7}(50.250362 + 48.713705 + 47.085645 + 46.342528 + 45.979736 + 45.620949 + 45.265195) + \frac{1}{4}(49.910120 + 49.382538 + 48.902329 + 48.456400)\right)$$

Result:

48.099860517857142857142857142857142857142857142857142857142...

Repeating decimal:

$48.0998605178\overline{571428}$ (period 6)

48.09986… ≈ 48

Now, we take the same previous expression, but attributing to Ω an inverse value to that of before. We obtain the following expressions:

Ln[((((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1/22))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log\left(\frac{1}{22}\right)}\right)$$

log(x) is the natural logarithm

Result:

50.250362... +
3.1415927... i

Polar coordinates:

$r = 50.3485$ (radius), $\theta = 0.0624375$ (angle)

50.3485

Polar forms:

$50.3485 (\cos(0.0624375) + i \sin(0.0624375))$

$50.3485\, e^{0.0624375\, i}$

Ln[((((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1/(1741630))))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log\left(\frac{1}{1741630}\right)}\right)$$

log(x) is the natural logarithm

Result:

48.713705... +
3.1415927... i

Polar coordinates:

$r = 48.8149$ (radius), $\theta = 0.0644018$ (angle)

48.8149

Polar forms:

$48.8149(\cos(0.0644018) + i\sin(0.0644018))$

$48.8149\, e^{0.0644018\, i}$

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1/(6.184782206826024 × 10^31)))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log\left(\frac{1}{6.184782206826024\times 10^{31}}\right)}\right)$$

log(x) is the natural logarithm

Result:

47.085645... +
3.1415927... i

Polar coordinates:

$r = 47.1903$ (radius), $\theta = 0.0666221$ (angle)

47.1903

Polar forms:

$47.1903 (\cos(0.0666221) + i \sin(0.0666221))$

$47.1903\, e^{0.0666221\, i}$

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1/(6.92723391760212 × 10^66)))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log\left(\frac{1}{6.92723391760212\times 10^{66}}\right)}\right)$$

log(x) is the natural logarithm

Result:

46.342528… +
3.1415927… i

Polar coordinates:

$r = 46.4489$ (radius), $\theta = 0.0676871$ (angle)

46.4489

Polar forms:

$46.4489 (\cos(0.0676871) + i \sin(0.0676871))$

$46.4489\, e^{0.0676871\, i}$

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1/(1.1814398741285991 × 10^96)))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log\left(\frac{1}{1.1814398741285991\times 10^{96}}\right)}\right)$$

log(x) is the natural logarithm

Result:

45.979736… +
3.1415927… i

Polar coordinates:

$r = 46.0869$ (radius), $\theta = 0.0682196$ (angle)

46.0869

Polar forms:

$46.0869\,(\cos(0.0682196) + i\sin(0.0682196))$

$46.0869\,e^{0.0682196\,i}$

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1/(3.4400033735581529*10^137)))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log\left(\frac{1}{3.4400033735581529\times 10^{137}}\right)}\right)$$

log(x) is the natural logarithm

Result:

45.620949… +
3.1415927… i

Polar coordinates:

$r = 45.729$ (radius), $\theta = 0.0687544$ (angle)

45.729

Polar forms:

$45.729 (\cos(0.0687544) + i \sin(0.0687544))$

$45.729 e^{0.0687544 i}$

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1/(1.9951134337408105736642454427*10^196)))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log\left(\frac{1}{1.99511343374081057366424542 7\times 10^{196}}\right)}\right)$$

$\log(x)$ is the natural logarithm

Result:

$45.265195\ldots +$
$3.1415927\ldots i$

Polar coordinates:

$r = 45.3741$ (radius), $\theta = 0.069293$ (angle)

45.3741

Polar forms:

$45.3741 (\cos(0.069293) + i \sin(0.069293))$

$45.3741 e^{0.069293 i}$

Mean:

1/7(50.3485 + 48.8149 + 47.1903 + 46.4489 + 46.0869 + 45.729 + 45.3741)

(50.3485 + 48.8149 + 47.1903 + 46.4489 + 46.0869 + 45.729 + 45.3741) = **329.9926**

1/7(50.3485 + 48.8149 + 47.1903 + 46.4489 + 46.0869 + 45.729 + 45.3741)

Input interpretation:

$$\frac{1}{7}(50.3485 + 48.8149 + 47.1903 + 46.4489 + 46.0869 + 45.729 + 45.3741)$$

Result:

47.1418

47.1418

We have also:

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1/77))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times 10^{-23}\log\left(\frac{1}{77}\right)}\right)$$

$\log(x)$ is the natural logarithm

Result:

$49.910120\ldots +$
$3.1415927\ldots i$

Polar coordinates:

$r = 50.0089$ (radius), $\theta = 0.0628621$ (angle)

50.0089

Polar forms:

$$50.0089 (\cos(0.0628621) + i \sin(0.0628621))$$

$$50.0089 e^{0.0628621 i}$$

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1/1575))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times10^{-23}\log\left(\frac{1}{1575}\right)}\right)$$

$\log(x)$ is the natural logarithm

Result:

$49.382538\ldots +$
$3.1415927\ldots i$

Polar coordinates:

$r = 49.4824$ (radius), $\theta = 0.0635319$ (angle)

49.4824

Polar forms:

$49.4824\,(\cos(0.0635319) + i\sin(0.0635319))$

$49.4824\,e^{0.0635319\,i}$

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1/147273))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times10^{-23}\log\left(\frac{1}{147\,273}\right)}\right)$$

log(x) is the natural logarithm

Result:

48.902329... +
3.1415927... i

Polar coordinates:

$r = 49.0031$ (radius), $\theta = 0.064154$ (angle)

49.0031

Ln[(((((√(10-2√5) -2))/((√5-1)))/(1.38e-23 ln(1/118114304))))]

Input interpretation:

$$\log\left(\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{1.38\times10^{-23}\log\left(\frac{1}{118\,114\,304}\right)}\right)$$

log(x) is the natural logarithm

Result:

48.456400… +
3.1415927… i

Polar coordinates:

$r = 48.5581$ (radius), $\theta = 0.0647428$ (angle)

48.5581

Polar forms:

$48.5581 (\cos(0.0647428) + i \sin(0.0647428))$

$48.5581 \, e^{0.0647428 \, i}$

Mean

(50.0089+49.4824+49.0031+48.5581) = **197.0525**

1/4(50.0089+49.4824+49.0031+48.5581)

Input interpretation:

$\frac{1}{4}(50.0089 + 49.4824 + 49.0031 + 48.5581)$

Result:

49.263125

49.263125

The general mean of the two sequences is:

1/2((1/7(50.3485 + 48.8149 + 47.1903 + 46.4489 + 46.0869 + 45.729 + 45.3741)+1/4(50.0089+49.4824+49.0031+48.5581)))

Input interpretation:

$$\frac{1}{2}\left(\frac{1}{7}(50.3485 + 48.8149 + 47.1903 + 46.4489 + 46.0869 + 45.729 + 45.3741) + \frac{1}{4}(50.0089 + 49.4824 + 49.0031 + 48.5581)\right)$$

Result:

48.2024625

48.2024625 ≈ 48

Thence:

49.16284675

47.03687428571

48.09986… ≈ 48

49.263125

47.1418

48.2024625 ≈ 48

General Mean

48.2024625 ≈ 48

48.09986… ≈ 48

From

1/(48.2024625 *1/ 48.09986)

Input interpretation:

$$\frac{1}{48.2024625 \times \frac{1}{48.09986}}$$

Result:

0.99787142617454450589531603286865271665322077684309178187732628880...

0.997871426…. result very near to the value of the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{\pi}{\sqrt{5}}}}{\frac{\sqrt{5}}{1+\sqrt[5]{\sqrt{\varphi^5 \sqrt[4]{5^3}}-1}}-\varphi+1} = 1-\frac{e^{-\pi\sqrt{5}}}{1+\frac{e^{-2\pi\sqrt{5}}}{1+\frac{e^{-3\pi\sqrt{5}}}{1+\frac{e^{-4\pi\sqrt{5}}}{1+\ldots}}}} \approx 0.9991104684$$

and to the Omega mesons (ω/ω_3 | $5+3$ | $m_{u/d} = 255 - 390$ | $0.988 - 1.18$) Regge slope value (0.988) connected to the dilaton scalar field $\mathbf{0.989117352243 = \phi}$

A_1^{**} above the two low-lying pseudo-scalars. (bound states of gluons, or 'glueballs')

A_1^{**}	0.943(39) [2.5]	0.988(38)	0.152(53)
A_4	1.03(10) [2.5]	0.999(32)	0.035(21)

(**Glueball Regge trajectories -** *Harvey Byron Meyer*, Lincoln College -Thesis submitted for the degree of Doctor of Philosophy at the University of Oxford Trinity Term, 2004)

Note that

$$\sqrt[32]{\zeta(2)-1}$$

$$\sqrt[32]{\frac{\pi^2}{6} - 1}$$

= 0.98638703135648129 15… $(\pi^2/6 - 1)^{1/32}$

We know that α' is the Regge slope (string tension). With regard the Omega mesons, the values are:

ω	6	$m_{u/d} = 0 - 60$	$0.910 - 0.918$	
ω/ω_3	$5 + 3$	$m_{u/d}' = 255 - 390$	$0.988 - 1.18$	
ω/ω_3	$5 + 3$	$m_{u/d} = 240 - 345$	$0.937 - 1.000$	
Ψ	3	$m_c = 1500$	0.979	-0.09

1/(48.2024625 *0.0207900813)

where

$$\frac{1}{48.09986}$$

0.020790081301691938396494293330583498579829546281423688135474822 5
…

Input interpretation:

$$\frac{1}{48.2024625 \times 0.0207900813}$$

Result:

0.997871426255753278306861746163821739279524917629138078723820803 1
…

0.997871426….as above

1/(48.2024625 - 48.09986)

Input interpretation:

$$\frac{1}{48.2024625 - 48.09986}$$

Result:

9.7463512097658439121853756000097463512097658439121853756000097463
…

9.7463512097…

Repeating decimal:

$9.\overline{746351209765843912185375600009}$ (period 30)

From which:

1/6*1/(48.2024625 - 48.09986)

Input interpretation:

$$\frac{1}{6} \times \frac{1}{48.2024625 - 48.09986}$$

Result:

1.6243918682943073186975626000016243918682943073186975626000016243
…

1.624391868…. result that is a good approximation to the value of the golden ratio 1.618033988749...

Repeating decimal:

$1.\overline{624391868294307318697562600001}$ (period 30)

From:

Inflationary Imprints on Dark Matter
Sami Nurmi, Tommi Tenkanen and Kimmo Tuominen - arXiv:1506.04048v2 [astro-ph.CO] 4 Nov 2015

We have that:

The evolution of number density of the singlet scalar is determined by the Boltzmann equation

$$\dot{n}_s + 3Hn_s = \int d\Pi_h d\Pi_{s_1} d\Pi_{s_2} (2\pi)^4 \delta^4 (p_h - p_{s_1} - p_{s_2}) \times \left(|\mathcal{M}|^2_{h \to ss} f_h (1 + f_s)(1 + f_s) - |\mathcal{M}|^2_{ss \to h} f_s f_s (1 + f_h) \right), \quad (2.2)$$

where $d\Pi_i = d^3k_i/((2\pi)^3 2E_i)$, $\mathcal{M}$ is the transition amplitude and f_i is the usual phase space density of particle i. The Higgs particles are assumed to be in thermal equilibrium, and in the usual approximation one assumes that Maxwell-Boltzmann statistics can be used instead of Bose-Einstein, $f_h \simeq e^{-E_h/T}$.

Setting $f_s = 0$ on the right hand side of Eq. (2.2) the singlet abundance, produced at low temperatures by thermal Higgs particles only, then becomes [34]

$$\Omega_s h^2 \approx 1.73 \times 10^{27} \frac{m_s \Gamma_{h \to ss}}{m_h^2} = 1.73 \times 10^{27} \frac{m_s}{m_h^2} \left(\frac{\lambda_{sh}^2 \nu^2}{32\pi m_h} \sqrt{1 - 4m_s^2/m_h^2} \right). \quad (2.3)$$

In the limit, $m_s \ll m_h$, this yields a parametric estimate for the coupling sufficient to produce a sizeable dark matter abundance

$$\lambda_{sh} \simeq 10^{-11} \left(\frac{\Omega_s h^2}{0.12} \right)^{1/2} \left(\frac{\text{GeV}}{m_s} \right)^{1/2}. \quad (2.4)$$

$m_s \lesssim 50$ GeV $\quad \lambda_{sh} \lesssim 10^{-7}$.

$$\Omega_s h^2 \approx 1.73 \times 10^{27} \frac{m_s \Gamma_{h \to ss}}{m_h^2} = 1.73 \times 10^{27} \frac{m_s}{m_h^2} \left(\frac{\lambda_{sh}^2 \nu^2}{32\pi m_h} \sqrt{1 - 4m_s^2/m_h^2} \right) \quad (2.3)$$

1.73e+27*(50/125.1^2) ((((((10^-7)^2*1^2))/(32Pi*125.1)*sqrt(1-(4*(50^2)/(125.1^2))))))

Input interpretation:

$$1.73\times 10^{27}\times \frac{50}{125.1^2}\left(\frac{\left(\frac{1}{10^7}\right)^2\times 1^2}{32\,\pi\times 125.1}\sqrt{1-4\times \frac{50^2}{125.1^2}}\right)$$

Result:

$2.64065\ldots \times 10^6$

$2.64065\ldots*10^6$

Now, for (((($\sqrt{}$(10-2$\sqrt{}$5) -2))/(($\sqrt{}$5-1)))) = κ = 8πG; G = 0.011303146014

We observe that:

[(((($\sqrt{}$(10-2$\sqrt{}$5) -2))/(($\sqrt{}$5-1))))1/(0.011303146014)]

Input interpretation:

$$\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}\times \frac{1}{0.011303146014}$$

Result:

25.132741229…

25.132741229…. ≈ 8π

(0.28407904384 1/(0.011303146014))

Input interpretation:

$$0.28407904384\times \frac{1}{0.011303146014}$$

Result:

25.132741228693464881219042173120068481493474583013557096211108009
…

25.13274122….

where 0.28407904384 = κ and 0.011303146014 = g = gravitational coupling constant

and:

1/8*[((((√(10-2√5) -2))/((√5-1))))1/(0.011303146014)]

Input interpretation:

$$\frac{1}{8}\left(\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}\times\frac{1}{0.011303146014}\right)$$

Result:

3.1415926536…

3.1415926536….≈π

1.73e+27*(50/125.1^2) ((((((10^-7)^2*1^2))/((4[((((√(10-2√5) -2))/((√5-1))))/(0.011303146014)])*125.1)*sqrt(1-(4*(50^2)/(125.1^2))))))

Input interpretation:

$$1.73\times10^{27}\times\frac{50}{125.1^2}\left(\frac{\left(\frac{1}{10^7}\right)^2\times1^2}{\left(4\times\frac{\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}}{0.011303146014}\right)\times125.1}\sqrt{1-4\times\frac{50^2}{125.1^2}}\right)$$

Result:

$2.64065\ldots\times10^6$

$2.64065\ldots*10^6$

From:

$$\Gamma^{(2)}_{s_0\to hh} = \frac{\lambda^2_{\rm sh}}{64\pi}\frac{s_0^2}{m_{\rm s}}\sqrt{1-\left(\frac{m_{\rm h}}{m_{\rm s}}\right)^2}\,. \tag{4.12}$$

$m_{\rm s} \lesssim 50$ GeV $\quad \lambda_{\rm sh} \lesssim 10^{-7}$.

((10^-7)^2)/(64Pi*50)*sqrt(1-(125.1/50)^2)

Input:

$$\frac{\left(\frac{1}{10^7}\right)^2}{64\,\pi}\times\frac{1}{50}\sqrt{1-\left(\frac{125.1}{50}\right)^2}$$

Result:

$2.28136\ldots\times 10^{-18}\, i$

Polar coordinates:

$r = 2.28136\times 10^{-18}$ (radius), $\quad \theta = 1.5708$ (angle)

$2.28136*10^{-18}$

Polar forms:

$2.28136\times 10^{-18}\,(\cos(1.5708) + i\sin(1.5708))$

$2.28136\times 10^{-18}\, e^{1.5708\, i}$

Series representations:

$$\frac{\sqrt{1-\left(\frac{125.1}{50}\right)^2}\left(\frac{1}{10^7}\right)^2}{50\,(64\,\pi)} = \frac{\sqrt{-6.26}\,\sum_{k=0}^{\infty}(-6.26)^{-k}\binom{\frac{1}{2}}{k}}{320\,000\,000\,000\,000\,000\,\pi}$$

$$\frac{\sqrt{1-\left(\frac{125.1}{50}\right)^2}\left(\frac{1}{10^7}\right)^2}{50\,(64\,\pi)} = \frac{\sqrt{-6.26}\,\sum_{k=0}^{\infty}\frac{e^{-1.83418\,k}\left(-\frac{1}{2}\right)_k}{k!}}{320\,000\,000\,000\,000\,000\,\pi}$$

$$\frac{\sqrt{1-\left(\frac{125.1}{50}\right)^2}\left(\frac{1}{10^7}\right)^2}{50\,(64\,\pi)} = \frac{\sum_{j=0}^{\infty}\mathrm{Res}_{s=-\frac{1}{2}+j}\,(-6.26)^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{640\,000\,000\,000\,000\,000\,\pi\,\sqrt{\pi}}$$

((10^-7)^2)/(8[((((√(10-2√5) -2))/((√5-1))))1/(0.011303146014)])*1/50*sqrt(1-(125.1/50)^2)

Input interpretation:

$$\frac{\left(\frac{1}{10^7}\right)^2}{8\left(\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}\times\frac{1}{0.011303146014}\right)}\times\frac{1}{50}\sqrt{1-\left(\frac{125.1}{50}\right)^2}$$

Result:

$2.28136\ldots\times 10^{-18}\,i$

Polar coordinates:

$r = 2.28136\times 10^{-18}$ (radius), $\theta = 1.5708$ (angle)

$2.28136*10^{-18}$

Polar forms:

$2.28136\times 10^{-18}\,(\cos(1.5708) + i\sin(1.5708))$

$2.28136\times 10^{-18}\,e^{1.5708\,i}$

((10^-7)^2)/(8[((((√(10-2√5) -2))⁄((√5-1))))1/(0.011303146014)])*1/50*sqrt(1-(125.1/50)^2) / [1.73e+27*(50/125.1^2) ((((((10^-7)^2*1^2))/(32Pi*125.1)*sqrt(1-(4*(50^2)/(125.1^2))))))]

Input interpretation:

$$\frac{\frac{\left(\frac{1}{10^7}\right)^2}{8\left(\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}\times\frac{1}{0.011303146014}\right)}\times\frac{1}{50}\times\sqrt{1-\left(\frac{125.1}{50}\right)^2}}{1.73\times10^{27}\times\frac{50}{125.1^2}\left(\frac{\left(\frac{1}{10^7}\right)^2\times1^2}{32\pi\times125.1}\sqrt{1-4\times\frac{50^2}{125.1^2}}\right)}$$

Result:

$8.63936\ldots\times10^{-25}\, i$

Polar coordinates:

$r = 8.63936\times10^{-25}$ (radius), $\theta = 1.5708$ (angle)

$8.63936*10^{-25}$

Polar forms:

$8.63936\times10^{-25}\,(\cos(1.5708)+i\sin(1.5708))$

$8.63936\times10^{-25}\,e^{1.5708\,i}$

Dividing this expression with the previous

$1.38\times10^{-23}\log(1.1814398741285991\times10^{96})$

we obtain:

1.38e-23 ln(1.181439e+96)1/(((((10^-7)^2)/(8[(((√(10-2√5) -2))⁄((√5-1)))1/(0.0113031)])1/50sqrt(1-(125.1/50)^2)/[1.73e+27(50/125.1^2)((((((10^-7)^2*1^2))/(32Pi*125.1)sqrt(1-(4(50^2)/(125.1^2))))))])))

Input interpretation:

$$1.38\times 10^{-23}\log\left(1.181439\times 10^{96}\right)\times \frac{1}{\frac{\left(\frac{1}{10^7}\right)^2}{8\left(\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}\times\frac{1}{0.0113031}\right)}\times\frac{1}{50}\times\frac{\sqrt{1-\left(\frac{125.1}{50}\right)^2}}{1.73\times 10^{27}\times\frac{50}{125.1^2}\left(\frac{\left(\frac{1}{10^7}\right)^2\times 1^2}{32\,\pi\times 125.1}\sqrt{1-4\times\frac{50^2}{125.1^2}}\right)}}$$

$\log(x)$ is the natural logarithm

Result:

-0
$3533.57\ldots\, i$

Polar coordinates:

$r = 3533.57$ (radius), $\theta = -1.5708$ (angle)

3533.57

Polar forms:

$3533.57\,(\cos(-1.5708) + i\sin(-1.5708))$

$3533.57\, e^{-1.5708\, i}$

[1.38e-23 ln(1.181439e+96)1/(((10^-7)^2)/(8[((√(10-2√5) -2))⁄((√5-1))1/(0.0113031)])1/50sqrt(1-(125.1/50)^2)/[1.73e+27(50/125.1^2)((((10^-7)^2*1^2))/(32Pi*125.1)sqrt(1-(4(50^2)/(125.1^2))))])]^1/17

Input interpretation:

$$\left(1.38\times 10^{-23}\log(1.181439\times 10^{96})\times \frac{1}{\frac{\left(\frac{1}{10^7}\right)^2}{8\left(\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}\times\frac{1}{0.0113031}\right)}\times\frac{1}{50}\times\frac{\sqrt{1-\left(\frac{125.1}{50}\right)^2}}{1.73\times 10^{27}\times\frac{50}{125.1^2}\left(\frac{\left(\frac{1}{10^7}\right)^2\times 1^2}{32\pi\times 125.1}\sqrt{1-4\times\frac{50^2}{125.1^2}}\right)}}\right)^{\wedge}(1/17)$$

$\log(x)$ is the natural logarithm

Result:

1.61013… −
0.149201… i

Polar coordinates:

$r = 1.61703$ (radius), $\theta = -0.0923998$ (angle)

1.61703 result that is a very good approximation to the value of the golden ratio 1.618033988749...

Polar forms:

$1.61703\,(\cos(-0.0923998) + i\sin(-0.0923998))$

$1.61703\, e^{-0.0923998\, i}$

In more detail, the corresponding Boltzmann equation for singlet particles (4.5) in the quartic regime $T \gtrsim T_{\rm trans}$ is given by,

$$\frac{dY_s^{(4)}}{dT} = -\frac{K_1\left(\frac{m_h}{T}\right)}{K_2\left(\frac{m_h}{T}\right)}\frac{\Gamma^{(4)}_{h\to sh}}{Hs_bT}n_h - \frac{\Gamma^{(4)}_{s_0\to ss}}{Hs_bT}n_{s_0}\,, \tag{5.8}$$

where $Y_s \equiv n_s/s_b$ denotes the singlet number density normalized by the entropy density of the bath s_b and where we used $\dot{T} \simeq -HT$, which is an excellent approximation above the EW scale. With the rates given in Eqs. (4.7), (4.9) and (4.10), the solution of Eq. (5.8) is

$$Y_s^{(4)}(T) = \left(4\times 10^4\lambda_{sh}^2\lambda_s^{-5/8}\left(\frac{r}{0.1}\right)^{3/4} + 5\times 10^2\lambda_s^{1/2}\left(\frac{r}{0.1}\right)\right)\frac{\rm GeV}{T}. \tag{5.9}$$

$\lambda_{sh} \lesssim 10^{-7}.$

r = 10^-8 λ_s = 10^-6

[(4*10^4*(10^-7)^2*(10^-6)^(-5/8)*((10^-8)/(0.1))^0.75)+5*10^2*sqrt(10^-6)*((10^-8)/(0.1))]

Input interpretation:

$$4\times 10^4\left(\frac{1}{10^7}\right)^2\left(\frac{1}{10^6}\right)^{-5/8}\left(\frac{1}{10^8\times 0.1}\right)^{0.75} + 5\times 10^2\sqrt{\frac{1}{10^6}}\times\frac{1}{10^8\times 0.1}$$

Result:

$5.00126\ldots\times 10^{-8}$

$5.00126\ldots*10^{-8}$

(((1/((2*sqrt[(4*10^4*(10^-7)^2*(10^-6)^(-5/8)*((10^-8)/(0.1))^0.75)+5*10^2*sqrt(10^-6)*((10^-8)/(0.1)))]))))^1/16

Input interpretation:

$$\sqrt[16]{\frac{1}{2\sqrt{4\times 10^4\left(\frac{1}{10^7}\right)^2\left(\frac{1}{10^6}\right)^{-5/8}\left(\frac{1}{10^8\times 0.1}\right)^{0.75} + 5\times 10^2\sqrt{\frac{1}{10^6}}\times\frac{1}{10^8\times 0.1}}}}$$

Result:

1.6193449813917199660927920136656863880454756114919017365627767336

...

1.61934498139….. result that is a very good approximation to the value of the golden ratio 1.618033988749...

(2*0.9568666+1/2*(((√(10-2√5) -2))/((√5-1)))) (((√(10-2√5) -2))/((√5-1)))^8 1/ [(4*10^4*(10^-7)^2*(10^-6)^(-5/8)*((10^-8)/(0.1))^0.75)+5*10^2*sqrt(10^-6)*((10^-8)/(0.1))] -16+0.6556795+0.9991104

Input interpretation:

$$\left(2\times 0.9568666+\frac{1}{2}\times\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}\right)\left(\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}\right)^8\times\frac{1}{4\times 10^4\left(\frac{1}{10^7}\right)^2\left(\frac{1}{10^6}\right)^{-5/8}\left(\frac{1}{10^8\times 0.1}\right)^{0.75}+5\times 10^2\sqrt{\frac{1}{10^6}}\times\frac{1}{10^8\times 0.1}}-16+0.6556795+0.9991104$$

Result:

1729.1020734324660280384078747294494609904177534281926414319493518

...

1729.102073…

This result is very near to the mass of candidate glueball **f_0(1710) scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

((2*0.95686+1/2(((√(10-2√5) -2))/((√5-1)))) (((√(10-2√5) -2))/((√5-1)))^8 1/[(4*10^4 (10^-7)^2(10^-6)^(-5/8)((10^-8)/(0.1))^0.75)+5*10^2*sqrt(10^-6)*((10^-8)/(0.1))] -16+0.6556795+0.9991104)^1/15

Input interpretation:

$$\left(\frac{\left(2\times 0.95686+\frac{1}{2}\times\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}\right)\left(\frac{\sqrt{10-2\sqrt{5}}-2}{\sqrt{5}-1}\right)^8\times\frac{1}{4\times 10^4\left(\frac{1}{10^7}\right)^2\left(\frac{1}{10^6}\right)^{-5/8}\left(\frac{1}{10^8\times 0.1}\right)^{0.75}+5\times 10^2\sqrt{\frac{1}{10^6}}\times\frac{1}{10^8\times 0.1}}-}{16+0.6556795+0.9991104}\right)\text{^}(1/15)$$

Result:

1.6438209887018387562791634044596645926833103317372749536308079854
...

1.6438209887…..≈ $\zeta(2) = \frac{\pi^2}{6} = 1.644934$ ...

Observations

We note that, from the number 8, we obtain as follows:

8^2

64

$8^2 \times 2 \times 8$

1024

$8^4 = 8^2 \times 2^6$

True

$8^4 = 4096$

$8^2 \times 2^6 = 4096$

$2^{13} = 2 \times 8^4$

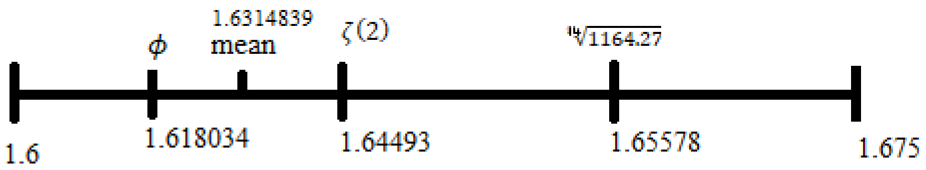
True

$2^{13} = 8192$

$2 \times 8^4 = 8192$

We notice how from the numbers 8 and 2 we get 64, 1024, 4096 and 8192, and that 8 is the fundamental number. In fact $8^2 = 64$, $8^3 = 512$, $8^4 = 4096$. We define it "fundamental number", since 8 is a Fibonacci number, which by rule, divided by the previous one, which is 5, gives 1.6 , a value that tends to the golden ratio, as for all numbers in the Fibonacci sequence

“Golden” Range



Finally we note how $8^2 = 64$, multiplied by 27, to which we add 1, is equal to 1729, the so-called "Hardy-Ramanujan number". Then taking the 15th root of 1729, we obtain a value close to $\zeta(2)$ that 1.6438 ..., which, in turn, is included in the range of what we call "golden numbers"

Furthermore for all the results very near to 1728 or 1729, adding $64 = 8^2$, one obtain values about equal to 1792 or 1793. These are values almost equal to the Planck multipole spectrum frequency 1792.35 and to the hypothetical Gluino mass

Mathematical connections with some sectors of String Theory

From:

Modular equations and approximations to π - *Srinivasa Ramanujan*
Quarterly Journal of Mathematics, XLV, 1914, 350 – 372

We have that:

Hence

$$\begin{aligned} 64g_{22}^{24} &= e^{\pi\sqrt{22}} - 24 + 276e^{-\pi\sqrt{22}} - \cdots, \\ 64g_{22}^{-24} &= 4096e^{-\pi\sqrt{22}} + \cdots, \end{aligned}$$

so that

$$64(g_{22}^{24} + g_{22}^{-24}) = e^{\pi\sqrt{22}} - 24 + 4372e^{-\pi\sqrt{22}} + \cdots = 64\{(1+\sqrt{2})^{12} + (1-\sqrt{2})^{12}\}.$$

Hence

$$e^{\pi\sqrt{22}} = 2508951.9982\ldots.$$

Again

$$G_{37} = (6+\sqrt{37})^{\frac{1}{4}},$$

$$\begin{aligned} 64G_{37}^{24} &= e^{\pi\sqrt{37}} + 24 + 276e^{-\pi\sqrt{37}} + \cdots, \\ 64G_{37}^{-24} &= 4096e^{-\pi\sqrt{37}} - \cdots, \end{aligned}$$

so that

$$64(G_{37}^{24} + G_{37}^{-24}) = e^{\pi\sqrt{37}} + 24 + 4372e^{-\pi\sqrt{37}} - \cdots = 64\{(6+\sqrt{37})^{6} + (6-\sqrt{37})^{6}\}.$$

Hence

$$e^{\pi\sqrt{37}} = 199148647.999978\ldots.$$

Similarly, from

$$g_{58} = \sqrt{\left(\frac{5+\sqrt{29}}{2}\right)},$$

we obtain

$$64(g_{58}^{24} + g_{58}^{-24}) = e^{\pi\sqrt{58}} - 24 + 4372e^{-\pi\sqrt{58}} + \cdots = 64\left\{\left(\frac{5+\sqrt{29}}{2}\right)^{12} + \left(\frac{5-\sqrt{29}}{2}\right)^{12}\right\}.$$

Hence

$$e^{\pi\sqrt{58}} = 24591257751.99999982\ldots.$$

From:

An Update on Brane Supersymmetry Breaking
J. Mourad and A. Sagnotti - arXiv:1711.11494v1 [hep-th] 30 Nov 2017

From the following vacuum equations:

$$T\, e^{\gamma_E\, \phi} \;=\; -\,\frac{\beta_E^{(p)}\, h^2}{\gamma_E}\; e^{\,-\,2\,(8\,-\,p)\,C\,+\,2\,\beta_E^{(p)}\,\phi}$$

$$16\, k'\, e^{\,-\,2\,C} \;=\; \frac{h^2\left(p\;+\;1\;-\;\frac{2\,\beta_E^{(p)}}{\gamma_E}\right) e^{\,-\,2\,(8\,-\,p)\,C\,+\,2\,\beta_E^{(p)}\,\phi}}{(7\;-\;p)}$$

$$(A')^2 \;=\; k\, e^{\,-\,2\,A} \;+\; \frac{h^2}{16(p\;+\;1)}\left(7\;-\;p\;+\;\frac{2\,\beta_E^{(p)}}{\gamma_E}\right)\, e^{\,-\,2\,(8\,-\,p)\,C\,+\,2\,\beta_E^{(p)}\,\phi}$$

we have obtained, from the results almost equals of the equations, putting

$4096\, e^{-\pi\sqrt{18}}$ instead of

$$e^{\,-\,2\,(8\,-\,p)\,C\,+\,2\,\beta_E^{(p)}\,\phi}$$

a new possible mathematical connection between the two exponentials. Thence, also the values concerning p, C, β_E and ϕ correspond to the exponents of *e* (i.e. of exp). Thence we obtain for p = 5 and $\beta_E = 1/2$:

$$e^{-6C+\phi} = 4096 e^{-\pi\sqrt{18}}$$

Therefore, with respect to the exponentials of the vacuum equations, the Ramanujan's exponential has a coefficient of 4096 which is equal to 642, while -6C+ϕ is equal to -$\pi\sqrt{18}$. From this it follows that it is possible to establish mathematically, the dilaton value.

For

exp((-Pi*sqrt(18)) we obtain:

Input:

$\exp\left(-\pi\sqrt{18}\right)$

Exact result:

$e^{-3\sqrt{2}\pi}$

Decimal approximation:

$1.6272016226072509292942156739117979541838581136954016\ldots \times 10^{-6}$

$1.6272016\ldots * 10^{-6}$

Property:

$e^{-3\sqrt{2}\pi}$ is a transcendental number

Series representations:

$$e^{-\pi\sqrt{18}} = e^{-\pi\sqrt{17}\sum_{k=0}^{\infty}17^{-k}\binom{1/2}{k}}$$

$$e^{-\pi\sqrt{18}} = \exp\left(-\pi\sqrt{17}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{17}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$e^{-\pi\sqrt{18}} = \exp\left(-\frac{\pi\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}17^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)$$

Now, we have the following calculations:

$$e^{-6C+\phi} = 4096e^{-\pi\sqrt{18}}$$

$$e^{-\pi\sqrt{18}} = 1.6272016\ldots * 10\text{^-}6$$

from which:

$$\frac{1}{4096}e^{-6C+\phi} = 1.6272016\ldots * 10\text{^-}6$$

$$0.000244140625\, e^{-6C+\phi} = e^{-\pi\sqrt{18}} = 1.6272016\ldots * 10\text{^-}6$$

Now:

$$\ln\left(e^{-\pi\sqrt{18}}\right) = -13.328648814475 = -\pi\sqrt{18}$$

And:

(1.6272016* 10^-6) *1/ (0.000244140625)

Input interpretation:

$$\frac{1.6272016}{10^6} \times \frac{1}{0.000244140625}$$

Result:

0.0066650177536

0.006665017...

Thence:

$$0.000244140625\, e^{-6C+\phi} = e^{-\pi\sqrt{18}}$$

Dividing both sides by 0.000244140625, we obtain:

$$\frac{0.000244140625}{0.000244140625}e^{-6C+\phi} = \frac{1}{0.000244140625}e^{-\pi\sqrt{18}}$$

$$e^{-6C+\phi} = 0.0066650177536$$

((((exp((-Pi*sqrt(18)))))))*1/0.000244140625

Input interpretation:

$$\exp\left(-\pi\sqrt{18}\right) \times \frac{1}{0.000244140625}$$

Result:

0.00666501785...

0.00666501785…

Series representations:

$$\frac{\exp\left(-\pi\sqrt{18}\right)}{0.000244141} = 4096 \exp\left(-\pi\sqrt{17}\sum_{k=0}^{\infty} 17^{-k}\binom{\frac{1}{2}}{k}\right)$$

$$\frac{\exp\left(-\pi\sqrt{18}\right)}{0.000244141} = 4096 \exp\left(-\pi\sqrt{17}\sum_{k=0}^{\infty} \frac{\left(-\frac{1}{17}\right)^k \left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\frac{\exp\left(-\pi\sqrt{18}\right)}{0.000244141} = 4096 \exp\left(-\frac{\pi\sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} 17^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)$$

Now:

$e^{-6C+\phi}$ = 0.0066650177536

$$\exp\left(-\pi\sqrt{18}\right)\times\frac{1}{0.000244140625} =$$

$$e^{-\pi\sqrt{18}}\times\frac{1}{0.000244140625}$$

= 0.00666501785…

From:

ln(0.00666501784619)

Input interpretation:

$\log(0.00666501784619)$

Result:

$-5.010882647757\ldots$

-5.010882647757…

Alternative representations:

$$\log(0.006665017846190000) = \log_e(0.006665017846190000)$$

$$\log(0.006665017846190000) = \log(a)\log_a(0.006665017846190000)$$

$$\log(0.006665017846190000) = -\mathrm{Li}_1(0.993334982153810000)$$

Series representations:

$$\log(0.006665017846190000) = -\sum_{k=1}^{\infty}\frac{(-1)^k\,(-0.993334982153810000)^k}{k}$$

$$\log(0.00666501784619000) = 2 i \pi \left\lfloor \frac{\arg(0.00666501784619000 - x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (0.00666501784619000 - x)^k x^{-k}}{k} \quad \text{for } x < 0$$

$$\log(0.00666501784619000) = \left\lfloor \frac{\arg(0.00666501784619000 - z_0)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left\lfloor \frac{\arg(0.00666501784619000 - z_0)}{2\pi} \right\rfloor \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (0.00666501784619000 - z_0)^k z_0^{-k}}{k}$$

Integral representation:

$$\log(0.00666501784619000) = \int_1^{0.00666501784619000} \frac{1}{t} \, dt$$

In conclusion:

$$-6C + \phi = -5.010882647757 \ldots$$

and for C = 1, we obtain:

$\phi = -5.010882647757 + 6 = \mathbf{0.989117352243} = \boldsymbol{\phi}$

Note that the values of n_s (spectral index) 0.965, of the average of the Omega mesons Regge slope 0.987428571 and of the dilaton 0.989117352243, are also connected to the following two Rogers-Ramanujan continued fractions:

$$\frac{e^{-\frac{\pi}{5}}}{\sqrt{(\varphi-1)\sqrt{5}} - \varphi + 1} = 1 - \frac{e^{-\pi}}{1 + \frac{e^{-2\pi}}{1 + \frac{e^{-3\pi}}{1 + \frac{e^{-4\pi}}{1 + \ldots}}}} \approx 0.9568666373$$

$$\frac{e^{-\frac{\pi}{\sqrt{5}}}}{\frac{\sqrt{5}}{1+\sqrt[5]{\sqrt{\varphi^5 \sqrt[4]{5^3}}-1}}-\varphi+1}=1-\cfrac{e^{-\pi\sqrt{5}}}{1+\cfrac{e^{-2\pi\sqrt{5}}}{1+\cfrac{e^{-3\pi\sqrt{5}}}{1+\cfrac{e^{-4\pi\sqrt{5}}}{1+\ldots}}}}\approx 0.9991104684$$

(http://www.bitman.name/math/article/102/109/)

The mean between the two results of the above Rogers-Ramanujan continued fractions is 0.97798855285, value very near to the ψ Regge slope 0.979:

Ψ	3	$m_c = 1500$	0.979	−0.09

Also performing the 512th root of the inverse value of the Pion meson rest mass 139.57, we obtain:

((1/(139.57)))^1/512

Input interpretation:

$$\sqrt[512]{\frac{1}{139.57}}$$

Result:

0.99040073270864402755097375571330141546073279617855555551684...

0.99040073.... result very near to the dilaton value $\mathbf{0.989117352243} = \boldsymbol{\phi}$ and to the value of the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{\pi}{\sqrt{5}}}}{\frac{\sqrt{5}}{1+\sqrt[5]{\sqrt{\varphi^5\sqrt[4]{5^3}}-1}}-\varphi+1} = 1-\cfrac{e^{-\pi\sqrt{5}}}{1+\cfrac{e^{-2\pi\sqrt{5}}}{1+\cfrac{e^{-3\pi\sqrt{5}}}{1+\cfrac{e^{-4\pi\sqrt{5}}}{1+\dots}}}} \approx 0.9991104684$$

From

AdS Vacua from Dilaton Tadpoles and Form Fluxes - *J. Mourad and A. Sagnotti* - arXiv:1612.08566v2 [hep-th] 22 Feb 2017 - March 27, 2018

We have:

$$\begin{aligned} e^{2C} &= \frac{2\,\xi\, e^{\frac{\phi}{2}}}{1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}} \\ \frac{h^2}{32} &= \frac{\xi^7 e^{4\phi}}{\left(1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}\right)^7} \left[\frac{42}{\xi}\left(1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}\right) + 5\, T\, e^{2\phi}\right] . \end{aligned} \qquad (2.7)$$

For

$T = \frac{16}{\pi^2}$

$\xi = 1$

we obtain:

(2*e^(0.989117352243/2)) / (1+sqrt(((1-1/3*16/(Pi)^2*e^(2*0.989117352243)))))

Input interpretation:

$$\frac{2\, e^{0.989117352243/2}}{1+\sqrt{1-\frac{1}{3}\times\frac{16}{\pi^2}\, e^{2\times 0.989117352243}}}$$

Result:

0.83941881822... −
1.4311851867... i

Polar coordinates:

$r = 1.65919106525$ (radius), $\theta = -59.607521917°$ (angle)

1.65919106525….. result very near to the 14th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164.2696$ i.e. 1.65578...

Series representations:

$$\frac{2\, e^{0.98911735224300000/2}}{1+\sqrt{1-\frac{16\, e^{2\times 0.98911735224300000}}{3\,\pi^2}}} = \frac{2\, e^{0.49455867612150000}}{1+\sqrt{-\frac{16\, e^{1.97823470448600000}}{3\,\pi^2}}\, \sum_{k=0}^{\infty}\left(\frac{3}{16}\right)^k\left(-\frac{e^{1.97823470448600000}}{\pi^2}\right)^{-k}\binom{\frac{1}{2}}{k}}$$

$$\frac{2\, e^{0.98911735224300000/2}}{1+\sqrt{1-\frac{16\, e^{2\times 0.98911735224300000}}{3\,\pi^2}}} = \frac{2\, e^{0.49455867612150000}}{1+\sqrt{-\frac{16\, e^{1.97823470448600000}}{3\,\pi^2}}\, \sum_{k=0}^{\infty}\frac{\left(-\frac{3}{16}\right)^k\left(-\frac{e^{1.97823470448600000}}{\pi^2}\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}}$$

$$\frac{2\, e^{0.98911735224300000/2}}{1+\sqrt{1-\frac{16\, e^{2\times 0.98911735224300000}}{3\,\pi^2}}} = \frac{2\, e^{0.49455867612150000}}{1+\sqrt{z_0}\, \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1-\frac{16\, e^{1.97823470448600000}}{3\,\pi^2}-z_0\right)^k z_0^{-k}}{k!}}$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

From

$$\frac{h^2}{32} = \frac{\xi^7 e^{4\phi}}{\left(1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}\right)^7} \left[\frac{42}{\xi}\left(1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}\right) + 5\, T\, e^{2\phi}\right]$$

We obtain:

e^(4*0.989117352243) / (((1+sqrt(1-1/3*16/(Pi)^2*e^(2*0.989117352243)))))^7 [42(1+sqrt(1-1/3*16/(Pi)^2*e^(2*0.989117352243)))+5*16/(Pi)^2*e^(2*0.989117352243)]

Input interpretation:

$$\frac{e^{4\times 0.989117352243}}{\left(1+\sqrt{1-\frac{1}{3}\times\frac{16}{\pi^2}\, e^{2\times 0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1-\frac{1}{3}\times\frac{16}{\pi^2}\, e^{2\times 0.989117352243}}\right)+5\times\frac{16}{\pi^2}\, e^{2\times 0.989117352243}\right)$$

Result:

50.84107889… −
20.34506335… i

Polar coordinates:

$r = 54.76072411$ (radius), $\theta = -21.80979492°$ (angle)

54.76072411…..

Series representations:

$$\left(\left(42\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)+\frac{5\times 16\,e^{2\times 0.9891173522430000}}{\pi^2}\right)e^{4\times 0.9891173522430000}\right)\Big/\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)^7 =$$

$$\left(2\left(40\,e^{5.934704113458000}+21\,e^{3.956469408972000}\,\pi^2+21\,e^{3.956469408972000}\,\pi^2\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\sum_{k=0}^{\infty}\left(\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\binom{\frac{1}{2}}{k}\right)\right)\Big/$$

$$\left(\pi^2\left(1+\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\sum_{k=0}^{\infty}\left(\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\binom{\frac{1}{2}}{k}\right)^7\right)$$

$$\left(\left(42\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)+\frac{5\times 16\,e^{2\times 0.9891173522430000}}{\pi^2}\right)e^{4\times 0.9891173522430000}\right)\Big/\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)^7 =$$

$$\left(2\left(40\,e^{5.934704113458000}+21\,e^{3.956469408972000}\,\pi^2+21\,e^{3.956469408972000}\,\pi^2\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\sum_{k=0}^{\infty}\frac{\left(-\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\Big/$$

$$\left(\pi^2\left(1+\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\sum_{k=0}^{\infty}\frac{\left(-\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^7\right)$$

$$\left(\left(42\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)+\frac{5\times 16\,e^{2\times 0.9891173522430000}}{\pi^2}\right)\right.$$

$$\left. e^{4\times 0.9891173522430000}\right)\Big/\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)^7 =$$

$$\left(2\left(40\,e^{5.934704113458000}+21\,e^{3.956469408972000}\,\pi^2+21\,e^{3.956469408972000}\right.\right.$$

$$\left.\left.\pi^2\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}-z_0\right)^k z_0^{-k}}{k!}\right)\right)\Big/$$

$$\left(\pi^2\left(1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}-z_0\right)^k z_0^{-k}}{k!}\right)^7\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

From which:

e^(4*0.989117352243) / (((1+sqrt(1-1/3*16/(Pi)^2*e^(2*0.989117352243)))))^7 [42(1+sqrt(1-1/3*16/(Pi)^2*e^(2*0.989117352243)))+5*16/(Pi)^2*e^(2*0.989117352243)]*1/34

Input interpretation:

$$\frac{e^{4\times 0.989117352243}}{\left(1+\sqrt{1-\frac{1}{3}\times\frac{16}{\pi^2}\,e^{2\times 0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1-\frac{1}{3}\times\frac{16}{\pi^2}\,e^{2\times 0.989117352243}}\right)+5\times\frac{16}{\pi^2}\,e^{2\times 0.989117352243}\right)\times\frac{1}{34}$$

Result:

1.495325850… −
0.5983842161… i

Polar coordinates:

$r = 1.610609533$ (radius), $\theta = -21.80979492°$ (angle)

1.610609533…. result that is a good approximation to the value of the golden ratio 1.618033988749...

Series representations:

$$\left(\left(42\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)+\frac{5\times 16\,e^{2\times 0.9891173522430000}}{\pi^2}\right)e^{4\times 0.9891173522430000}\right)\Big/\left(34\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)^7\right)=$$

$$\left(40\,e^{5.934704113458000}+21\,e^{3.956469408972000}\,\pi^2+21\,e^{3.956469408972000}\,\pi^2\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\sum_{k=0}^{\infty}\left(\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\binom{\frac{1}{2}}{k}\right)\Big/\left(17\,\pi^2\left(1+\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\sum_{k=0}^{\infty}\left(\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\binom{\frac{1}{2}}{k}\right)^7\right)$$

$$\left(\left(42\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)+\frac{5\times 16\,e^{2\times 0.9891173522430000}}{\pi^2}\right)e^{4\times 0.9891173522430000}\right)\Big/\left(34\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)^7\right)=$$

$$\left(40\,e^{5.934704113458000}+21\,e^{3.956469408972000}\,\pi^2+21\,e^{3.956469408972000}\,\pi^2\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\sum_{k=0}^{\infty}\frac{\left(-\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\Big/\left(17\,\pi^2\left(1+\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\sum_{k=0}^{\infty}\frac{\left(-\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^7\right)$$

$$\left(\left(42\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)+\frac{5\times 16\,e^{2\times 0.9891173522430000}}{\pi^2}\right)e^{4\times 0.9891173522430000}\right)\Big/\left(34\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)^7\right)=$$

$$\left(40\,e^{5.934704113458000}+21\,e^{3.956469408972000}\,\pi^2+21\,e^{3.956469408972000}\,\pi^2\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}-z_0\right)^k z_0^{-k}}{k!}\right)\Big/$$

$$\left(17\,\pi^2\left(1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}-z_0\right)^k z_0^{-k}}{k!}\right)^7\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

Now, we have:

$$e^{2C} = \frac{2\,\xi\,e^{-\frac{\phi}{2}}}{1+\sqrt{1+\frac{\xi\Lambda}{3}\,e^{2\phi}}}\,, \tag{2.9}$$

$$\frac{h^2}{32} = \frac{e^{-4\phi}}{\left[1+\sqrt{1+\frac{\Lambda}{3}\,e^{2\phi}}\right]^7}\left[42\left(1+\sqrt{1+\frac{\Lambda}{3}\,e^{2\phi}}\right)-13\,\Lambda\,e^{2\phi}\right]. \tag{2.10}$$

For:

$\xi = 1$

$\Lambda \simeq \frac{4\pi^2}{25}$

$\phi = 0.989117352243$

From

$$e^{2C} = \frac{2\,\xi\,e^{-\frac{\phi}{2}}}{1 + \sqrt{1 + \frac{\xi\Lambda}{3}\,e^{2\phi}}}\,,$$

we obtain:

((2*e^(-0.989117352243/2))) / ((((1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243)))))))

Input interpretation:

$$\frac{2\,e^{-0.989117352243/2}}{1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\,\pi^2\right)\right)e^{2\times 0.989117352243}}}$$

Result:

0.382082347529...

0.382082347529….

Series representations:

$$\frac{2\,e^{-0.98911735224300000/2}}{1+\sqrt{1+\frac{(4\,\pi^2)\,e^{2\times 0.98911735224300000}}{3\times 25}}} = 2\Bigg/\left(e^{0.49455867612150000}\left(1+\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)\right)$$

$$\frac{2\,e^{-0.98911735224300000/2}}{1+\sqrt{1+\frac{(4\,\pi^2)\,e^{2\times 0.98911735224300000}}{3\times 25}}} = 2\Bigg/\left(e^{0.49455867612150000}\left(1+\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)$$

$$\frac{2\,e^{-0.98911735224300000/2}}{1+\sqrt{1+\frac{(4\pi^2)\,e^{2\times 0.98911735224300000}}{3\times 25}}} = \frac{2}{e^{0.49455867612150000}\left(1+\sqrt{z_0}\,\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\,e^{1.97823470448600000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)}$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

From which:

1+1/(((4((2*e^(-0.989117352243/2))) / ((((1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))))))))

Input interpretation:

$$1+\frac{1}{4\times\frac{2\,e^{-0.989117352243/2}}{1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}}}}$$

Result:

1.65430921270...

1.6543092….. We note that, the result 1.6543092... is very near to the 14th root of the following Ramanujan's class invariant $Q = \left(G_{505}/G_{101/5}\right)^3 = 1164.2696$ i.e. 1.65578...

Indeed:

$$G_{505} = P^{-1/4}Q^{1/6} = (\sqrt{5}+2)^{1/2}\left(\frac{\sqrt{5}+1}{2}\right)^{1/4}(\sqrt{101}+10)^{1/4}$$
$$\times\left((130\sqrt{5}+29\sqrt{101})+\sqrt{169440+7540\sqrt{505}}\right)^{1/6}.$$

Thus, it remains to show that

$$(130\sqrt{5}+29\sqrt{101})+\sqrt{169440+7540\sqrt{505}} = \left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3,$$

which is straightforward. $\square$

$$\sqrt[14]{\left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3} = 1{,}65578\ldots$$

Series representations:

$$1+\frac{1}{\frac{4\left(2e^{-0.989117352243000/2}\right)}{1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.989117352243000}}{3\times 25}}}} =$$

$$1+\frac{e^{0.4945586761215000}}{8}+\frac{1}{8}e^{0.4945586761215000}\sqrt{\frac{4e^{1.978234704486000}\pi^2}{75}}$$
$$\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}$$

$$1+\frac{1}{\frac{4\left(2e^{-0.989117352243000/2}\right)}{1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.989117352243000}}{3\times 25}}}} =$$

$$1+\frac{e^{0.4945586761215000}}{8}+\frac{1}{8}e^{0.4945586761215000}\sqrt{\frac{4e^{1.978234704486000}\pi^2}{75}}$$
$$\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

$$1+\frac{1}{\frac{4\left(2\,e^{-0.98911735224300000/2}\right)}{1+\sqrt{1+\frac{(4\pi^2)\,e^{2\times 0.98911735224300000}}{3\times 25}}}}=1+\frac{e^{0.4945586761215000}}{8}+$$

$$\frac{1}{8}\,e^{0.4945586761215000}\,\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\,e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}$$

for (not ($z_0\in\mathbb{R}$ and $-\infty<z_0\leq 0$))

And from

$$\frac{h^2}{32}=\frac{e^{-4\phi}}{\left[1+\sqrt{1+\frac{\Lambda}{3}\,e^{2\phi}}\right]^7}\left[42\left(1+\sqrt{1+\frac{\Lambda}{3}\,e^{2\phi}}\right)-13\,\Lambda\,e^{2\phi}\right].$$

we obtain:

e^(-4*0.989117352243) / [1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243)))]^7 * [42(1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243)))-13*(4Pi^2)/25*e^(2*0.989117352243)]

Input interpretation:

$$\frac{e^{-4\times 0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\,(4\pi^2)\right)e^{2\times 0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\,(4\pi^2)\right)e^{2\times 0.989117352243}}-13\left(\frac{1}{25}\,(4\pi^2)\right)e^{2\times 0.989117352243}\right)\right)$$

Result:

$-0.034547055658\ldots$

-0.034547055658…

Series representations:

$$\left(\left(42\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\,13\,e^{2\times 0.9891173522430000}\right)\right)\right.$$
$$\left.e^{-4\times 0.9891173522430000}\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7=$$
$$-\left(\left(42\left(-25\,e^{1.978234704486000}+52\,e^{3.956469408972000}\,\pi^2-\right.\right.\right.$$
$$25\,e^{1.978234704486000}\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}$$
$$\left.\left.\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)\right)\Big/\left(25\,e^{5.934704113458000}\right.$$
$$\left.\left.\left(1+\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)^7\right)\right)$$

$$\left(\left(42\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\,13\,e^{2\times 0.9891173522430000}\right)\right.\right.$$

$$\left.e^{-4\times 0.9891173522430000}\right)\Bigg/\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7 =$$

$$-\left(\left(42\left(-25\,e^{1.978234704486000}+52\,e^{3.956469408972000}\,\pi^2-\right.\right.\right.$$

$$25\,e^{1.978234704486000}\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}$$

$$\left.\left.\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\Bigg/\left(25\,e^{5.934704113458000}\right.$$

$$\left.\left.\left(1+\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^7\right)\right)$$

$$\left(\left(42\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\,13\,e^{2\times 0.9891173522430000}\right)\right.\right.$$

$$\left.e^{-4\times 0.9891173522430000}\right)\Bigg/\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7 =$$

$$-\left(\left(42\left(-25\,e^{1.978234704486000}+52\,e^{3.956469408972000}\,\pi^2-25\,e^{1.978234704486000}\right.\right.\right.$$

$$\left.\left.\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\,e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)\right)\Bigg/\left(25\right.$$

$$e^{5.934704113458000}$$

$$\left.\left.\left(1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\,e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)^7\right)\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

From which:

47 *1/(((-1/((((((e^(-4*0.989117352243) / [1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))]^7 * [42(1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))-13*(4Pi^2)/25*e^(2*0.989117352243))]))))))))

Input interpretation:

$$47\left(-\left(1/1/\left(\frac{e^{-4\times0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times0.989117352243}}-13\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times0.989117352243}\right)\right)\right)\right)\right)$$

Result:

1.6237116159...

1.6237116159…. result that is an approximation to the value of the golden ratio 1.618033988749...

Series representations:

$$-\left(47/1/\left(e^{-4\times0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{\left(4\pi^2\right)e^{2\times0.9891173522430000}}{3\times25}}-\frac{1}{25}\left(4\pi^2\right)13\,e^{2\times0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{\left(4\pi^2\right)e^{2\times0.9891173522430000}}{3\times25}}\right)^7\right)=$$

$$\left(1974\left(-25\,e^{1.978234704486000}+52\,e^{3.956469408972000}\,\pi^2-25\,e^{1.978234704486000}\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)\right)\Big/\left(25\,e^{5.934704113458000}\left(1+\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)^7\right)$$

$$-\left(47 \Big/ 1 \Big/ \left(e^{-4\times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}} - \frac{1}{25}(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right) \Big/ \left(1 + \sqrt{1 + \frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right) =$$

$$\left(1974\left(-25\, e^{1.978234704486000} + 52\, e^{3.956469408972000}\, \pi^2 - 25\, e^{1.978234704486000} \sqrt{\frac{4\, e^{1.978234704486000}\, \pi^2}{75}} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k \left(e^{1.978234704486000}\, \pi^2\right)^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)\right) \Big/ \left(25\, e^{5.934704113458000} \left(1 + \sqrt{\frac{4\, e^{1.978234704486000}\, \pi^2}{75}} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k \left(e^{1.978234704486000}\, \pi^2\right)^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)^7\right)$$

$$-\left(47 \Big/ 1 \Big/ \left(e^{-4\times 0.9891173522430000} \left(42 \left(1 + \sqrt{1 + \frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}} - \frac{1}{25}(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right) \Big/ \left(1 + \sqrt{1 + \frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right) =$$

$$\left(1974\left(-25\, e^{1.978234704486000} + 52\, e^{3.956469408972000}\, \pi^2 - 25\, e^{1.978234704486000} \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4\, e^{1.978234704486000}\, \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!}\right)\right) \Big/ \left(25\, e^{5.934704113458000} \left(1 + \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1 + \frac{4\, e^{1.978234704486000}\, \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!}\right)^7\right)$$

for (not $(z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0))$

And again:

32((((e^(-4*0.989117352243) /
[1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))]^7 *
[42(1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))-
13*(4Pi^2)/25*e^(2*0.989117352243))]))))

Input interpretation:

$$32\left(\frac{e^{-4\times 0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}}-13\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}\right)\right)\right)$$

Result:

-1.1055057810...

-1.1055057810….

We note that the result -1.1055057810…. is very near to the value of Cosmological Constant, less 10^{-52} , thence 1.1056, with minus sign

Series representations:

$$\left(32\, e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right.\right.\right. -$$

$$\left.\left.\left.\frac{1}{25}\,(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right)\Big/$$

$$\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7 =$$

$$-\left(\left(1344\left(-25\, e^{1.978234704486000} + 52\, e^{3.956469408972000}\, \pi^2 -\right.\right.\right.$$

$$25\, e^{1.978234704486000}\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}$$

$$\left.\left.\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k \left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)\right)\Big/\left(25\, e^{5.934704113458000}\right.$$

$$\left.\left.\left(1+\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k \left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)^7\right)\right)$$

$$\left(32\, e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\,13\, e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7=$$

$$-\left(\left(1344\left(-25\, e^{1.978234704486000}+52\, e^{3.956469408972000}\,\pi^2-25\, e^{1.978234704486000}\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\Big/\left(25\, e^{5.934704113458000}\left(1+\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^7\right)\right)$$

$$\left(32\, e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\,13\, e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7=$$

$$-\left(\left(1344\left(-25\, e^{1.978234704486000}+52\, e^{3.956469408972000}\,\pi^2-25\, e^{1.978234704486000}\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\, e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)\right)\Big/\left(25\, e^{5.934704113458000}\left(1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\, e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)^7\right)\right)$$

for (not ($z_0\in\mathbb{R}$ and $-\infty< z_0\leq 0$))

And:

-[32((((e^(-4*0.989117352243) / [1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))]^7 * [42(1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))-13*(4Pi^2)/25*e^(2*0.989117352243))])))))]^5

Input interpretation:

$$-\left(32\left(\frac{e^{-4\times0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times0.989117352243}}-13\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times0.989117352243}\right)\right)\right)\right)^5$$

Result:

1.651220569...

1.651220569…. result very near to the 14th root of the following Ramanujan's class invariant $Q = \left(G_{505}/G_{101/5}\right)^3 = 1164.2696$ i.e. 1.65578...

Series representations:

$$-\left(\left(32\, e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)^5 =$$

$$\left(4\,385\,270\,057\,140\,224\left(-25+52\, e^{1.978234704486000}\,\pi^2-25\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)^5\right)\Big/\left(9\,765\,625\, e^{19.78234704486000}\left(1+\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)^{35}\right)$$

$$-\left(\left(32\, e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)^5 =$$

$$\left(4\,385\,270\,057\,140\,224\left(-25+52\, e^{1.978234704486000}\,\pi^2-25\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^5\right)\Big/$$

$$\left(9\,765\,625\, e^{19.78234704486000}\left(1+\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^{35}\right)$$

$$-\left(\left(32\, e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)^5 =$$

$$\left(4\,385\,270\,057\,140\,224\left(-25+52\, e^{1.978234704486000}\,\pi^2-25\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\, e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)^5\right)\Big/$$

$$\left(9\,765\,625\, e^{19.78234704486000}\left(1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\, e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)^{35}\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

We obtain also:

-[32((((e^(-4*0.989117352243) / [1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))]^7 * [42(1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))-13*(4Pi^2)/25*e^(2*0.989117352243))])))]^1/2

Input interpretation:

$$-\sqrt{\left(32\left(\frac{e^{-4\times 0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}}-13\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}\right)\right)\right)\right)}$$

Result:

-0

$1.0514303501\ldots\, i$

Polar coordinates:

$r = 1.05143035007$ (radius), $\theta = -90°$ (angle)

1.05143035007

Series representations:

$$-\sqrt{\left(\left(32\, e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\;-\;\frac{1}{25}\,(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)} = -\frac{8}{5}\sqrt{21}$$

$$\sqrt{\left(\left(25-52\, e^{1.978234704486000}\,\pi^2+25\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k \left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)\Big/\left(e^{3.956469408972000}\left(1+\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k \left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)^7\right)\right)}$$

$$-\sqrt{\left(\left(32 e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\,13\,e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)} = -\frac{8}{5}\sqrt{21}$$

$$\sqrt{\left(\left(25-52 e^{1.978234704486000}\pi^2+25\sqrt{\frac{4 e^{1.978234704486000}\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\Big/\left(e^{3.956469408972000}\left(1+\sqrt{\frac{4 e^{1.978234704486000}\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^7\right)\right)}$$

$$-\sqrt{\left(\left(32 e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\,13\,e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)} =$$

$$-\frac{8}{5}\sqrt{21}\sqrt{\left(\left(25-52 e^{1.978234704486000}\pi^2+25\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4 e^{1.978234704486000}\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)\Big/\left(e^{3.956469408972000}\left(1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4 e^{1.978234704486000}\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)^7\right)\right)}$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

1 / -[32((((e^(-4*0.989117352243) / [1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))]^7 * [42(1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))-13*(4Pi^2)/25*e^(2*0.989117352243))])))))]^1/2

Input interpretation:

$$-\left(1\Bigg/\left(\sqrt{\left(32\left(\frac{e^{-4\times 0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}}-13\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}\right)\right)\right)\right)}\right)\right)$$

Result:

$0.95108534763\ldots i$

Polar coordinates:

$r = 0.95108534763$ (radius), $\theta = 90°$ (angle)

0.95108534763

We know that the primordial fluctuations are consistent with Gaussian purely adiabatic scalar perturbations characterized by a power spectrum with a spectral index $n_s = 0.965 \pm 0.004$, consistent with the predictions of slow-roll, single-field, inflation.

Thence 0.95108534763 is a result very near to the spectral index n_s, to the mesonic Regge slope, to the inflaton value at the end of the inflation 0.9402 and to the value of the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{\pi}{5}}}{\sqrt{(\varphi-1)\sqrt{5}-\varphi+1}}=1-\cfrac{e^{-\pi}}{1+\cfrac{e^{-2\pi}}{1+\cfrac{e^{-3\pi}}{1+\cfrac{e^{-4\pi}}{1+\ldots}}}}\approx 0.9568666373$$

Series representations:

$$-\left(1\Bigg/\left(\sqrt{\left(\left(32\,e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\,e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\,13\,e^{2\times 0.9891173522430000}\right)\right)\right)\Bigg/\left(1+\sqrt{1+\frac{(4\pi^2)\,e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)}\right)\right)=$$

$$-\left(5\Bigg/\left(8\sqrt{21}\sqrt{\left(\left(25-52\,e^{1.978234704486000}\,\pi^2+25\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)\Bigg/\left(e^{3.956469408972000}\left(1+\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)^7\right)\right)}\right)\right)$$

$$-\left(1\Big/\left(\sqrt{\left(\left(32\, e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)}\right)\right)=$$

$$-\left(5\Big/\left(8\sqrt{21}\sqrt{\left(\left(25-52\, e^{1.978234704486000}\,\pi^2+25\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\Big/\left(e^{3.956469408972000}\left(1+\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^7\right)\right)}\right)\right)$$

$$-\left(1\Bigg/\left(\sqrt{\left(\left(32\,e^{-4\times 0.98911735224300000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\,e^{2\times 0.98911735224300000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\,13\,e^{2\times 0.98911735224300000}\right)\right)\right)\Bigg/\left(1+\sqrt{1+\frac{(4\pi^2)\,e^{2\times 0.98911735224300000}}{3\times 25}}\right)^7\right)}\right)\right)=$$

$$-\left(5\Bigg/\left(8\sqrt{21}\sqrt{\left(\left(25-52\,e^{1.978234704486000}\,\pi^2+25\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\,e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)\Bigg/\left(e^{3.956469408972000}\left(1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\,e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)^7\right)\right)}\right)\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

From the previous expression

$$\frac{\dfrac{e^{-4\times 0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}(4\pi^2)\right)e^{2\times 0.989117352243}}\right)^7}}{\left(42\left(1+\sqrt{1+\dfrac{1}{3}\left(\dfrac{1}{25}(4\pi^2)\right)e^{2\times 0.989117352243}}-13\left(\dfrac{1}{25}(4\pi^2)\right)e^{2\times 0.989117352243}\right)\right)}$$

= -0.034547055658…

we have also:

1+1/(((4((2*e^(-0.989117352243/2))) / ((((1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243)))))))))) + (-0.034547055658)

Input interpretation:

$$1+\frac{1}{4\times\frac{2\,e^{-0.989117352243/2}}{1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\,\pi^2\right)\right)e^{2\times 0.989117352243}}}}-0.034547055658$$

Result:

1.61976215705...

1.61976215705….. result that is a very good approximation to the value of the golden ratio 1.618033988749...

Series representations:

$$1+\frac{1}{\frac{4\left(2\,e^{-0.98911735224430000/2}\right)}{1+\sqrt{1+\frac{\left(4\,\pi^2\right)e^{2\times 0.98911735224430000}}{3\times 25}}}}-0.0345470556580000=$$
$$0.9654529443420000+\frac{e^{0.49455867612150000}}{8}+\frac{1}{8}\,e^{0.49455867612150000}\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}$$

$$1+\frac{1}{\frac{4\left(2\,e^{-0.98911735224430000/2}\right)}{1+\sqrt{1+\frac{\left(4\,\pi^2\right)e^{2\times 0.98911735224430000}}{3\times 25}}}}-0.0345470556580000=$$
$$0.9654529443420000+\frac{e^{0.49455867612150000}}{8}+\frac{1}{8}\,e^{0.49455867612150000}\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

$$1+\frac{1}{\frac{4\left(2\,e^{-0.98911735224300000/2}\right)}{1+\sqrt{1+\frac{(4\,\pi^2)\,e^{2\times 0.98911735224300000}}{3\times 25}}}}-0.0345470556580000=$$

$$0.9654529443420000+\frac{e^{0.4945586761215000}}{8}+$$

$$\frac{1}{8}\,e^{0.4945586761215000}\,\sqrt{z_0}\,\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\,e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k\,z_0^{-k}}{k!}$$

for (not ($z_0\in\mathbb{R}$ and $-\infty<z_0\leq 0$))

From

Properties of Nilpotent Supergravity

E. Dudas, S. Ferrara, A. Kehagias and A. Sagnotti - arXiv:1507.07842v2 [hep-th] 14 Sep 2015

We have that:

Cosmological inflation with a tiny tensor–to–scalar ratio r, consistently with PLANCK data, may also be described within the present framework, for instance choosing

$$\alpha(\Phi)\;=\;i\,M\left(\Phi\;+\;b\,\Phi\,e^{ik\,\Phi}\right)\;. \tag{4.35}$$

This potential bears some similarities with the Kähler moduli inflation of [32] and with the poly–instanton inflation of [33]. One can verify that $\chi=0$ solves the field equations, and that the potential along the $\chi=0$ trajectory is now

$$V\;=\;\frac{M^2}{3}\left(1\;-\;a\;\phi\;e^{-\gamma\,\phi}\right)^2\;. \tag{4.36}$$

We analyzing the following equation:

$$V\;=\;\frac{M^2}{3}\left(1\;-\;a\;\phi\;e^{-\gamma\,\phi}\right)^2\;.$$

$$\phi\;=\;\varphi\;-\;\frac{\sqrt{6}}{k}\;,$$

$$a = \frac{b\gamma}{e} < 0\,, \qquad \gamma = \frac{k}{\sqrt{6}} < 0\,.$$

We have:

(M^2)/3*[1-(b/euler number * k/sqrt6) * (φ- sqrt6/k) * exp(-(k/sqrt6)(φ- sqrt6/k))]^2

i.e.

V = (M^2)/3*[1-(b/euler number * k/sqrt6) * (φ- sqrt6/k) * exp(-(k/sqrt6)(φ- sqrt6/k))]^2

For k = 2 and φ = 0.9991104684, that is the value of the scalar field that is equal to the value of the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{\pi}{\sqrt{5}}}}{\frac{\sqrt{5}}{1+\sqrt[5]{\sqrt{\varphi^5\sqrt[4]{5^3}}-1}}-\varphi+1} = 1-\frac{e^{-\pi\sqrt{5}}}{1+\frac{e^{-2\pi\sqrt{5}}}{1+\frac{e^{-3\pi\sqrt{5}}}{1+\frac{e^{-4\pi\sqrt{5}}}{1+\ldots}}}} \approx 0.9991104684$$

we obtain:

V = (M^2)/3*[1-(b/euler number * 2/sqrt6) * (0.9991104684- sqrt6/2) * exp(-(2/sqrt6)(0.9991104684- sqrt6/2))]^2

Input interpretation:

$$V = \frac{M^2}{3}\left(1-\left(\frac{b}{e}\times\frac{2}{\sqrt{6}}\right)\left(0.9991104684-\frac{\sqrt{6}}{2}\right)\exp\left(-\frac{2}{\sqrt{6}}\left(0.9991104684-\frac{\sqrt{6}}{2}\right)\right)\right)^2$$

Result:

$$V = \frac{1}{3}(0.0814845\,b+1)^2 M^2$$

Solutions:

$$b = \frac{225.913\left(-0.054323\,M^2 \pm 6.58545\times 10^{-10}\sqrt{M^4}\right)}{M^2} \quad (M \neq 0)$$

Alternate forms:

$$V = 0.00221324\,(b + 12.2723)^2\,M^2$$

$$V = 0.00221324\left(b^2\,M^2 + 24.5445\,b\,M^2 + 150.609\,M^2\right)$$

$$-0.00221324\,b^2\,M^2 - 0.054323\,b\,M^2 - \frac{M^2}{3} + V = 0$$

Expanded form:

$$V = 0.00221324\,b^2\,M^2 + 0.054323\,b\,M^2 + \frac{M^2}{3}$$

Alternate form assuming b, M, and V are positive:

$$V = 0.00221324\,(b + 12.2723)^2\,M^2$$

Alternate form assuming b, M, and V are real:

$$V = 0.00221324\,b^2\,M^2 + 0.054323\,b\,M^2 + 0.333333\,M^2 + 0$$

Derivative:

$$\frac{\partial}{\partial b}\left(\frac{1}{3}\,(0.0814845\,b + 1)^2\,M^2\right) = 0.054323\,(0.0814845\,b + 1)\,M^2$$

Implicit derivatives:

$$\frac{\partial b(M, V)}{\partial V} = \frac{154\,317\,775\,011\,120\,075}{36\,961\,748\,(226\,802\,245 + 18\,480\,874\,b)\,M^2}$$

$$\frac{\partial b(M, V)}{\partial M} = -\frac{\frac{226\,802\,245}{18\,480\,874} + b}{M}$$

$$\frac{\partial M(b, V)}{\partial V} = \frac{154\,317\,775\,011\,120\,075}{2\,(226\,802\,245 + 18\,480\,874\,b)^2\,M}$$

$$\frac{\partial M(b, V)}{\partial b} = -\frac{18\,480\,874\,M}{226\,802\,245 + 18\,480\,874\,b}$$

$$\frac{\partial V(b, M)}{\partial M} = \frac{2\,(226\,802\,245 + 18\,480\,874\,b)^2\,M}{154\,317\,775\,011\,120\,075}$$

$$\frac{\partial V(b, M)}{\partial b} = \frac{36\,961\,748\,(226\,802\,245 + 18\,480\,874\,b)\,M^2}{154\,317\,775\,011\,120\,075}$$

Global minimum:

$$\min\left\{\frac{1}{3}\,(0.0814845\,b + 1)^2\,M^2\right\} = 0 \text{ at } (b, M) = (-16, 0)$$

Global minima:

$$\min\left\{\frac{1}{3} M^2 \left(1 - \frac{(b\ 2)\left(0.9991104684 - \frac{\sqrt{6}}{2}\right) \exp\left(-\frac{2\left(0.9991104684 - \frac{\sqrt{6}}{2}\right)}{\sqrt{6}}\right)}{e\sqrt{6}}\right)^2\right\} = 0$$

for $b = -\frac{226802245}{18480874}$

$$\min\left\{\frac{1}{3} M^2 \left(1 - \frac{(b\ 2)\left(0.9991104684 - \frac{\sqrt{6}}{2}\right) \exp\left(-\frac{2\left(0.9991104684 - \frac{\sqrt{6}}{2}\right)}{\sqrt{6}}\right)}{e\sqrt{6}}\right)^2\right\} = 0$$

for $M = 0$

From:

$$b = \frac{225.913\left(-0.054323\, M^2 \pm 6.58545 \times 10^{-10} \sqrt{M^4}\right)}{M^2} \quad (M \neq 0)$$

we obtain

(225.913 (-0.054323 M^2 + 6.58545×10^-10 sqrt(M^4)))/M^2

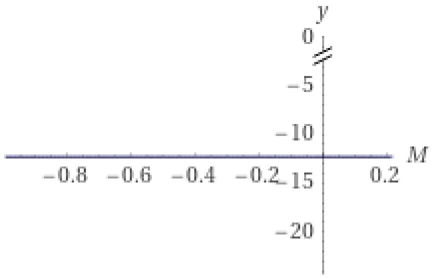
Input interpretation:

$$\frac{225.913\left(-0.054323\, M^2 + 6.58545 \times 10^{-10} \sqrt{M^4}\right)}{M^2}$$

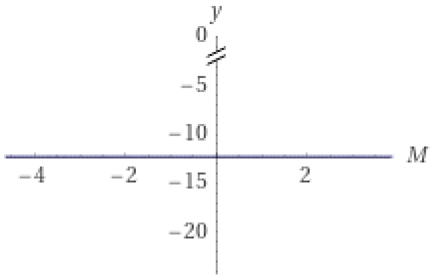
Result:

$$\frac{225.913\left(6.58545 \times 10^{-10} \sqrt{M^4} - 0.054323\, M^2\right)}{M^2}$$

Plots:



(M from −1 to 0.2)



(M from −4.6 to 3.9)

Alternate form assuming M is real:

-12.2723

-12.2723 result very near to the black hole entropy value 12.1904 = ln(196884)

Alternate forms:

$$-\frac{12.2723\left(M^2-1.21228\times 10^{-8}\sqrt{M^4}\right)}{M^2}$$

$$\frac{1.48774\times 10^{-7}\sqrt{M^4}-12.2723\,M^2}{M^2}$$

Expanded form:

$$\frac{1.48774\times10^{-7}\sqrt{M^4}}{M^2}-12.2723$$

Property as a function:

Parity

even

Series expansion at M = 0:

$$\left(\frac{1.48774\times10^{-7}\sqrt{M^4}}{M^2}-12.2723\right)+O\left(M^6\right)$$

(generalized Puiseux series)

Series expansion at M = ∞:

$$-12.2723$$

Derivative:

$$\frac{d}{dM}\left(\frac{225.913\left(6.58545\times10^{-10}\sqrt{M^4}-0.054323\,M^2\right)}{M^2}\right)=\frac{3.55271\times10^{-15}}{M}$$

Indefinite integral:

$$\int\frac{225.913\left(-0.054323\,M^2+6.58545\times10^{-10}\sqrt{M^4}\right)}{M^2}\,dM=$$

$$\frac{1.48774\times10^{-7}\sqrt{M^4}}{M}-12.2723\,M+\text{constant}$$

Global maximum:

$$\max\left\{\frac{225.913\left(6.58545\times 10^{-10}\sqrt{M^4}-0.054323\,M^2\right)}{M^2}\right\}=-\frac{140\,119\,826\,723\,990\,341\,497\,649}{11\,417\,594\,849\,251\,000\,000\,000}\ \text{at}\ M=-1$$

Global minimum:

$$\min\left\{\frac{225.913\left(6.58545\times 10^{-10}\sqrt{M^4}-0.054323\,M^2\right)}{M^2}\right\}=-\frac{140\,119\,826\,723\,990\,341\,497\,649}{11\,417\,594\,849\,251\,000\,000\,000}\ \text{at}\ M=-1$$

Limit:

$$\lim_{M\to\pm\infty}\frac{225.913\left(-0.054323\,M^2+6.58545\times 10^{-10}\sqrt{M^4}\right)}{M^2}=-12.2723$$

Definite integral after subtraction of diverging parts:

$$\int_0^{\infty}\left(\frac{225.913\left(-0.054323\,M^2+6.58545\times 10^{-10}\sqrt{M^4}\right)}{M^2}--12.2723\right)dM=0$$

From b that is equal to

$$\frac{225.913\left(-0.054323\,M^2+6.58545\times 10^{-10}\sqrt{M^4}\right)}{M^2}$$

from:

Result:

$$V = \frac{1}{3}(0.0814845\, b + 1)^2 M^2$$

we obtain:

1/3 (0.0814845 ((225.913 (-0.054323 M^2 + 6.58545×10^-10 sqrt(M^4)))/M^2) + 1)^2 M^2

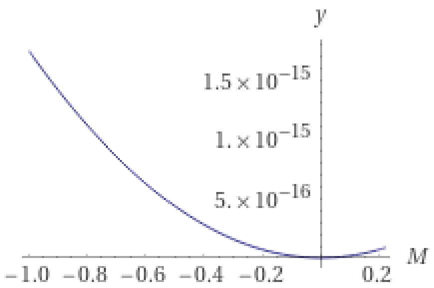
Input interpretation:

$$\frac{1}{3}\left(0.0814845 \times \frac{225.913\left(-0.054323\, M^2 + 6.58545 \times 10^{-10}\sqrt{M^4}\right)}{M^2} + 1\right)^2 M^2$$

Result:

0

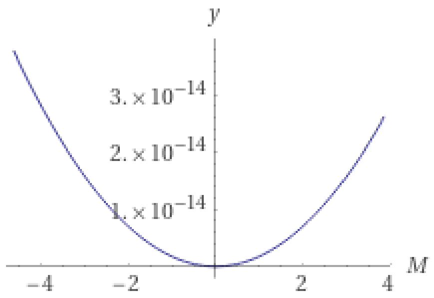
Plots: (possible mathematical connection with an open string)



(M from −1 to 0.2)

M = -0.5; M = 0.2

(possible mathematical connection with an open string)



(*M* from −4.6 to 3.9)

M = 2 ; M = 3

Root:

$M = 0$

Property as a function:

Parity

even

Series expansion at M = 0:

$O(M^{62194})$

(Taylor series)

Series expansion at M = ∞:

$1.75541 \times 10^{-15} M^2 + O\left(\left(\frac{1}{M}\right)^{62194}\right)$

(Taylor series)

Definite integral after subtraction of diverging parts:

$$\int_0^\infty \left(\frac{1}{3} M^2 \left(1 + \frac{18.4084\left(-0.054323\, M^2 + 6.58545\times 10^{-10} \sqrt{M^4}\right)}{M^2}\right)^2 - 1.75541\times 10^{-15} M^2\right) dM = 0$$

For M = - 0.5 , we obtain:

$$\frac{1}{3}\left(0.0814845\times \frac{225.913\left(-0.054323\, M^2 + 6.58545\times 10^{-10} \sqrt{M^4}\right)}{M^2} + 1\right)^2 M^2$$

1/3 (0.0814845 ((225.913 (-0.054323 (-0.5)^2 + 6.58545×10^-10 sqrt((-0.5)^4)))/(-0.5)^2) + 1)^2 * (-0.5^2)

Input interpretation:

$$\frac{1}{3}\left(0.0814845\times \frac{225.913\left(-0.054323\,(-0.5)^2 + 6.58545\times 10^{-10} \sqrt{(-0.5)^4}\right)}{(-0.5)^2} + 1\right)^2 (-0.5^2)$$

Result:

$$-4.38851344947464545348970783378088020833333333333333333\ldots \times 10^{-16}$$

$-4.38851344947 * 10^{-16}$

For M = 0.2:

$$\frac{1}{3}\left(0.0814845\times\frac{225.913\left(-0.054323\,M^2+6.58545\times10^{-10}\sqrt{M^4}\right)}{M^2}+1\right)^2 M^2$$

1/3 (0.0814845 ((225.913 (-0.054323 0.2^2 + 6.58545×10^-10 sqrt(0.2^4)))/0.2^2) + 1)^2 0.2^2

Input interpretation:

$$\frac{1}{3}\left(0.0814845\times\frac{225.913\left(-0.054323\times0.2^2+6.58545\times10^{-10}\sqrt{0.2^4}\right)}{0.2^2}+1\right)^2\times0.2^2$$

Result:

$$7.02162151915943272558353253404940833333333333333333333333\ldots\times10^{-17}$$

$7.021621519159*10^{-17}$

For M = 3:

$$\frac{1}{3}\left(0.0814845\times\frac{225.913\left(-0.054323\,M^2+6.58545\times10^{-10}\sqrt{M^4}\right)}{M^2}+1\right)^2 M^2$$

1/3 (0.0814845 ((225.913 (-0.054323 3^2 + 6.58545×10^-10 sqrt(3^4)))/3^2) + 1)^2 3^2

Input interpretation:

$$\frac{1}{3}\left(0.0814845\times\frac{225.913\left(-0.054323\times 3^2+6.58545\times 10^{-10}\sqrt{3^4}\right)}{3^2}+1\right)^2\times 3^2$$

Result:

$1.5798648418108723632562948201611168 75\times 10^{-14}$

1.57986484181*10^-14

For M = 2:

$$\frac{1}{3}\left(0.0814845\times\frac{225.913\left(-0.054323\,M^2+6.58545\times 10^{-10}\sqrt{M^4}\right)}{M^2}+1\right)^2 M^2$$

1/3 (0.0814845 ((225.913 (-0.054323 2^2 + 6.58545×10^-10 sqrt(2^4)))/2^2) + 1)^2 2^2

Input interpretation:

$$\frac{1}{3}\left(0.0814845\times\frac{225.913\left(-0.054323\times 2^2+6.58545\times 10^{-10}\sqrt{2^4}\right)}{2^2}+1\right)^2\times 2^2$$

Result:

$$7.021621519159432725583532534049408333333333333333333333333\ldots \times 10^{-15}$$

$7.021621519*10^{-15}$

From the four results

7.021621519*10^-15 ; 1.57986484181*10^-14 ; 7.021621519159*10^-17 ;

-4.38851344947*10^-16

we obtain, after some calculations:

sqrt[1/(2Pi)(7.021621519*10^-15 + 1.57986484181*10^-14 +7.021621519*10^-17 - 4.38851344947*10^-16)]

Input interpretation:

$$\sqrt{\left(\frac{1}{2\pi}\left(7.021621519\times 10^{-15} + 1.57986484181\times 10^{-14} + 7.021621519\times 10^{-17} - 4.38851344947\times 10^{-16}\right)\right)}$$

Result:

$$5.9776991059\ldots \times 10^{-8}$$

$5.9776991059*10^{-8}$ result very near to the Planck's electric flow 5.975498×10^{-8} that is equal to the following formula:

$$\phi_{\mathrm{P}}^{E} = \mathbf{E}_{\mathrm{P}} l_{\mathrm{P}}^{2} = \phi_{\mathrm{P}} l_{\mathrm{P}} = \sqrt{\frac{\hbar c}{\varepsilon_0}}$$

We note that:

1/55*((([(((1/[(7.021621519*10^-15 + 1.57986484181*10^-14 +7.021621519*10^-17 -4.38851344947*10^-16)])))^1/7]-((log^(5/8)(2))/(2 2^(1/8) 3^(1/4) e log^(3/2)(3)))))

Input interpretation:

$$\frac{1}{55}\left((1/(7.021621519\times 10^{-15} + 1.57986484181\times 10^{-14} + 7.021621519\times 10^{-17} - 4.38851344947\times 10^{-16}))\ \hat{}\ (1/7) - \frac{\log^{5/8}(2)}{2\sqrt[8]{2}\ \sqrt[4]{3}\ e\log^{3/2}(3)}\right)$$

$\log(x)$ is the natural logarithm

Result:

1.6181818182…

1.6181818182… result that is a very good approximation to the value of the golden ratio 1.618033988749...

From the Planck units:

Planck Length

$$l_{\mathrm{P}} = \sqrt{\frac{4\pi\hbar G}{c^3}}$$

5.729475 * 10^{-35} Lorentz-Heaviside value

Planck's Electric field strength

$$\mathbf{E}_\mathrm{P} = \frac{F_\mathrm{P}}{q_\mathrm{P}} = \sqrt{\frac{c^7}{16\pi^2\varepsilon_0\hbar G^2}}$$

1.820306 * 10^{61} V*m Lorentz-Heaviside value

Planck's Electric flux

$$\phi_\mathrm{P}^E = \mathbf{E}_\mathrm{P} l_\mathrm{P}^2 = \phi_\mathrm{P} l_\mathrm{P} = \sqrt{\frac{\hbar c}{\varepsilon_0}}$$

5.975498*10^{-8} V*m Lorentz-Heaviside value

Planck's Electric potential

$$\phi_P = V_P = \frac{E_P}{q_P} = \sqrt{\frac{c^4}{4\pi\varepsilon_0 G}}$$

1.042940*10^{27} V Lorentz-Heaviside value

Relationship between Planck's Electric Flux and Planck's Electric Potential

E_P * l_P = (1.820306 * 10^{61}) * 5.729475 * 10^{-35}

Input interpretation:

$$\frac{(1.820306 \times 10^{61}) \times 5.729475}{10^{35}}$$

Result:

1 042 939 771 935 000 000 000 000 000

Scientific notation:

$1.042939771935 \times 10^{27}$

$1.042939771935*10^{27} \approx 1.042940*10^{27}$

Or:

$\mathbf{E_P * l_P^2 / l_P} = (5.975498*10^{-8})*1/(5.729475 * 10^{-35})$

Input interpretation:

$$5.975498 \times 10^{-8} \times \frac{1}{\frac{5.729475}{10^{35}}}$$

Result:

$1.0429398854170757355604134759292954415544181622225422050013 3\ldots \times 10^{27}$

$1.042939885417*10^{27} \approx 1.042940*10^{27}$

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